YOUR

COMMODORE

DECEMBER 1989 £1.30

C64
AMIGA
C128
PLUS 4
PC



GHOSTBUSTERS II

I ain't afraid of no ghost!

Operation Thunderbolt
• Altered Beast • Batman

ISSN 0269-8277
12
9 770269 827007

DATEL ELECTRONICS

DATA RECORDER



- Quality Commodore compatible data recorder.
- Pause control, counter, etc.
- Suitable for 64/128.
- Send now for quick delivery.

ONLY £24.99



SPRINT 128

- Full feature Centronics Printer Interface.
- Connect your 64/128 to a range of full size Centronics Parallel Printers.
- Easy to use - supports Commodore Graphics Set.
- Onboard Microprocessor Chip means no power programmes to load.
- Works with most applications.
- No more to buy!

ONLY £29.99

PARALLEL PRINTER CABLE

- Connects full size printers to the parallel port of your C64/128.
- Many programmes and cartridges (Action Replay/Final Cartridge etc.) will drive printers from this port.

ONLY £12.99 COMPLETE

ROBOTEK 64



SPECIAL VALUE

MODEL & ROBOT CONTROL MADE EASY.

- 4 output channels - each with onboard relay.
- 4 input channels - each fully buffered TTL level sensing.
- Analogue input with full 8 bit conversion.
- Voice input for voice control.
- Software features:- test mode/ analogue measurement/voice activate/digital readout etc.

ONLY £39.99

INCLUDING HARDWARE/SOFTWARE/ MIC. ETC,(STATE TAPE OR DISK).

NOW WITH "JIFFY DOS"!



OCEANIC 118N DISK DRIVE FOR 64/128

NEW

ONLY £129.99 INCLUDING FREE OCP ART STUDIO!!

The Oceanic 118N is a superb quality Disk Drive specially designed for the Commodore 64/128.

Just look at these features...

- Slimline design - very compact.
- External Power Pack so no overheating problems (unlike some types).
- Ready to go - no more to buy.
- Direct drive motor for super quiet operation and extra long life.
- Now probably the best selling replacement Disk Drive for the 64/128.
- Comes complete with manuals, connecting leads etc.

FREE COPY OF OCP ADVANCED ART STUDIO OCP

(WORTH £29.99) WHILE STOCKS LAST

DIGITAL SOUND SAMPLER



- The new sampler allows you to record any sound digitally into memory & then replay it with astounding effects.
- Playback forwards/backwards with echo/reverb/ring modulation.
- Now with full sound editing module to produce outstanding effects.
- Full 8 bit D to A & ADC conversion.
- MIDI compatible with suitable interface. (i.e. Datel unit for £29.99, see ad.).
- Live effects menu includes real time display of waveforms.
- Line in/mic in/line out/feedback controls.
- Powerfull sequencer with editing features.
- Load/save sample. Up to 8 samples in memory at one time.
- Complete software/hardware package. Tape or Disk (please state).

ONLY £49.99

COM-DRUM

DIGITAL DRUM SYSTEM

- Now you can turn your digital sound sampler into a digital drum system.
- 8 digital drum sounds in memory at one time.
- Complete with 3 drum kits. Real drum sounds - not synthesised.
- Create superb drum rhythms with real & step time.
- Full editing. Menu driven. Load/ Save facilities.
- Output to hi-fi or through TV speaker.

ONLY £9.99

STATE TAPE OR DISK

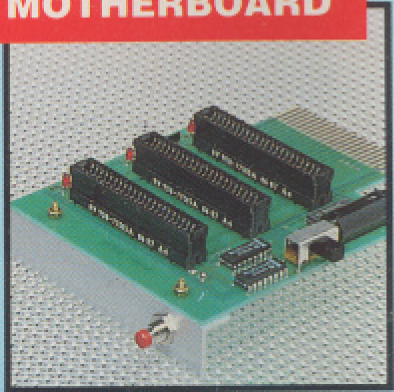
RESET CARTRIDGE



- Unstoppable reset button. NOTE:- user port cheaper type reset buttons offered by others are not unstoppable.
- Resets even so called "unstoppable" programs.
- Add pokes from magazines etc.
- Simply plugs in to cartridge port.

ONLY £5.99

3 SLOT MOTHERBOARD



SAVE WEAR & TEAR ON YOUR EXPANSION PORT

- Will accept three cartridges on it's high grade PCB.
- Switch in/out any slot.
- Fully buffered.
- Reset button and an onboard safety fuse.

ONLY £16.99

TOOLKIT IV

THE ULTIMATE DISK TOOLKIT FOR THE 1540/1541.

- A disk toolkit is an absolute must for the serious disk user. Toolkit IV has more features than most for less.
- DISC DOCTOR V2 - Read & write any track & sector including extra & renumbered tracks. Repair damaged sectors.
- HEADER/GAP EDITOR - Decodes & displays ALL header information including off bytes & header gap. Rewrite the entire header & header gap. Renumber sectors. Also edit any sector tail gap.
- DISK LOOK - Sort directory. Recover lost files. Display file start /end addresses. Disassemble any file program directly from the disk to SCREEN or PRINTER including undocumented opcodes. Edit Bam.
- FAST FILE COPY - Selective file copy. Works at up to 6 times normal speed.
- FAST DISK COPY - Copy an entire disk in 2 minutes or less using single 1541.
- FILE COMPACTOR - Can compact machine programs by up to 50%. Save disk space.
- FORMATTER - 10 second format an entire disk or format any individual track or half track 0 to 41.
- ERROR EDIT - Quickly find & recreate all read errors including extras & renumbered tracks or sectors & half tracks from 0 to 41.

ONLY £9.99

DATEL ELECTRONICS

UNBEATABLE MIDI PACKAGE!!



SAVE £30

DATEL MIDI 64 INTERFACE PLUS ADVANCED MUSIC SYSTEM

ONLY £39.99

NO MORE TO BUY - THE TOTAL MIDI CONNECTION



FREE MIDI CABLES



The Advanced Music System is probably the best MIDI/music package ever produced for the 64/128 offering a huge range of musical composition features plus MIDI compatibility - add the Datel MIDI Interface and you have the TOTAL MIDI SOLUTION!!

- KEYBOARD MODULE... allows for entry of music from the QWERTY keyboard. Sequencer works like digital recorder.
- EDITOR MODULE... just like a word processor for music. All the features you would expect.
- MIDI MODULE... this is the module which allows the full potential of the Music System and your MIDI keyboard to be achieved. Using the Datel MIDI 64 Interface any MIDI instrument (including Yamaha - see below) can be connected to your 64.
- SYNTHESISER MODULE... probably the most powerfull module. Create sounds with full waveform editing, realtime sequencing etc.
- PRINTER MODULE... allows you to print out your music to a range of printers including Commodore and Epson compatibles. Printout can be edited and can also include lyrics if required!
- LINKER MODULE... allows large musical compositions to be created from up to 26 files linked together - offering Tempo and Time Signature adjustments.
- HUGE RANGE OF FEATURES... Advanced Music System has literally hundreds of commands and features - we have only outlined the main headings - this is a truly professional package.

BUT THAT'S NOT ALL...

...WE CAN OFFER THE ABOVE MIDI PACKAGE TOGETHER WITH THE SUPERB YAMAHA SH10 MIDI SYNTHESISER FOR AN UNBEATABLE PRICE!!

Just look at these features...

- The world's first shoulder keyboard.
- With 25 built-in instrument choices.
- Choice of 25 rhythm styles.
- Vibrato, sustain and portamento special effects available.
- 3 fill-in variations for professional rhythm changeovers.
- Complete range of 32 keys for great melody play-a-long.
- Compose your own backing into the chord sequencer.



UNBEATABLE OFFER

ONLY £99.99

SYNTHESISER, MIDI 64 INTERFACE AND ADVANCED MUSIC SYSTEM PLUS FREE MIDI CABLES - NO MORE TO BUY!!



VIC 20 RAMPACK

- Simple plug-in memory expansion cartridges for your VIC 20.
- Never be short of memory again!
- Two models available - 16K or 32K.
- Both models are switchable for various memory settings i.e. 3K, 16K, 24K, etc.
- Many VIC programs require extra RAM - this is your answer.

ONLY £14.99 FOR 16K

ONLY £19.99 FOR 32K

NOW YOU CAN INCREASE THE MEMORY OF YOUR C16 EASILY



C16 RAMPACK

- Plug in RAM cartridge gives you up to 16K EXTRA MEMORY!!
- That's over 28K free for Basic and even an extra 18K in HiRes mode!
- Plugs in to memory expansion port - then just switch on.

ONLY £14.99

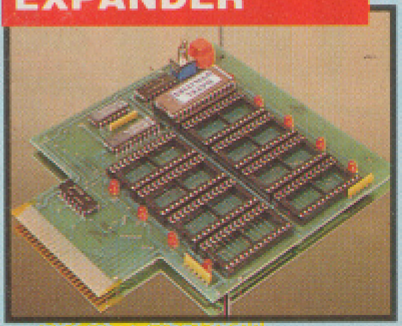
EPROM ERASER

- This handy AC/DC Eprom Eraser will erase up to 4 chips quickly and easily.
- Built-in timer and safety switch on cover.
- Superbly styled - small enough to fit in pocket - even as it works!!
- Works from built-in battery (supplied) or from AC/DC adaptor if required.

ONLY £39.99

LIMITED NUMBERS AT THIS AMAZINGLY LOW PRICE!!

256K SUPEROM EXPANDER



- Select instantly from 8 sockets which accept up to 32K EPROM each.
- Program your own EPROMs using our EPROM programer.
- No need to have lots of cartridges - just make a selection from the Superom menu.
- Fully menu driven on power up.
- Select any slot under software controls.
- Unique EPROM generator feature will take your own programs - basic or m/c & turn them into autostart EPROMs. (EPROM burner required).
- Accepts 2764/27128/27256 EPROMs.
- On board unstoppable reset.
- On board operating systems - no programs to load.

ONLY £29.99

EPROMMER 64™



- A top quality, easy-to-use EPROM programer for the 64/128.
- Fully menu driven software/hardware package makes programing/reading/verifying/copying EPROMs simplicity itself.
- Will program 2716, 2764, 27128 & 27256 chips, 12.5, 21 or 25 volts.
- Fits into user port for maximum compatibility with cartridges/Superom Board etc.
- Full feature system - all functions covered like device check/verify.
- We believe Eprommer 64 is the most comprehensive, most friendly & best value for money programer available for the 64/128.
- Ideal companion for Superom Board, Cartridge Development System, our kernal expanders or indeed any EPROM base project.
- Comes complete with instructions - plus the cartridge handbook.

ONLY £39.99 COMPLETE

ALL ORDERS NORMALLY DESPATCHED WITHIN 48 HRS

HOW TO ORDER ...

BY PHONE	BY POST	FAX
0782 744707 24hr Credit Card Line	Send cheques/POs made payable to "Datel Electronics"	0782 744292 UK ORDERS POST FREE EUROPE ADD £1 OVERSEAS ADD £3

PRICES AND SPECIFICATIONS CORRECT AT TIME OF PRESS AND SUBJECT TO CHANGE WITHOUT NOTICE

CALLERS WELCOME - Please reserve goods by telephone prior to visit.

DATEL ELECTRONICS

DATEL ELECTRONICS LTD., FENTON INDUSTRIAL ESTATE GOVAN ROAD, FENTON, STOKE-ON-TRENT, ENGLAND.

SALES ONLY	TECHNICAL ONLY
0782 744707	0782 744324

This Month's Programme



Above: Ghostbusters II, page 60



Above: Computer Auctions, page 66



Above: Altered Beast, page 24



Left: Flame On, page 70

THIS MONTH'S PROGRAMME

DE GEEZER TALKS...

Hell rumbled, growled and poured through small cracks in the pavement. It grew, expanding into a large, horrific monstrosity, lining the skyline and blotting the sun. It had a site and a name. The site was Earls Court. Its name was "PC Show".

I would like to take this opportunity to thank companies and freelancers for making my PC Show this year slightly better than being roasted on the spike of eternal pain (as it was last year). It wasn't a mammoth event, but at least my clothes weren't singed.

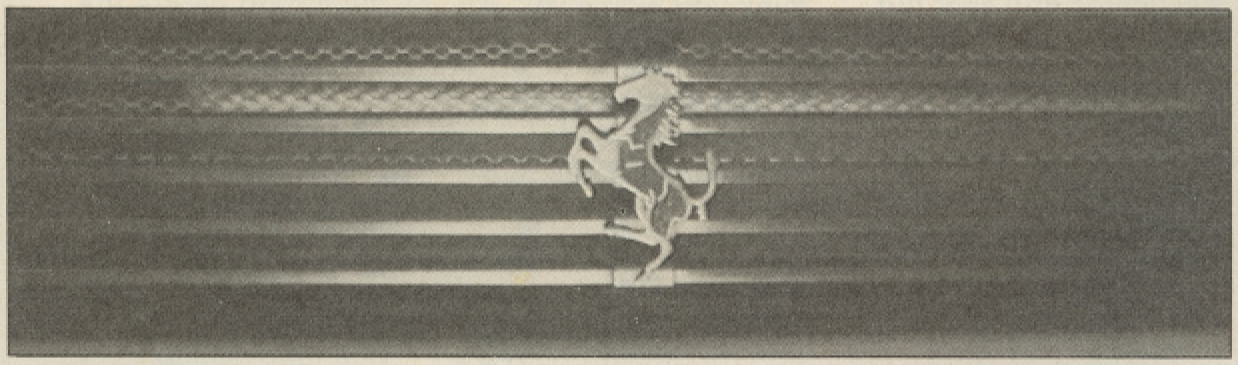
Those who haven't noticed, this is our Christmas issue (and what an issue), but I think I'll use the rest of this space to promote the next issue; it certainly deserves promoting.

As from next month, YC will be a different magazine to the one that we have all become used to over its five years of existence. One major move is the inclusion of a free cassette every issue, full of games, games, and more games. The interior will change in content too. Your Programmer will depart (alas, alack, and other words beginning with ala), but to replace it will be an abundance of new regular columns.

There will be new staff too, to make sure our games coverage will be the most up-to-date available, with tonnes of hot exclusives. So make sure you've got an order with your newsagent now, we wouldn't want you to miss out now, would we?

Rik Henderson

All the staff wish our readers a splendiferous Christmas.



Above: Sometimes we go too Ferrari!

Your Commodore incorporating Your 64 is a monthly magazine appearing on the first Friday of each month. Argus Specialist Publications Editorial and Advertisement office, *Your Commodore*, Argus House, Boundary Way, Hemel Hempstead HP2 7ST. Telephone: (0442) 66551. Subscription rates upon application to Your Commodore Subscriptions Department, Infonet Ltd, 5 River Park Estate, Berkhamsted, Herts HP4 1HL. U.S.A. Subscrpition Agent: Wise Owl Worldwide Publications, 4314 West 238th Street, Torrance CA 90505 U.S.A.

ISSN 0269-8277

ABC

Deputy Editor: *Richard Henderson*
Technical Editor: *Paul Eves*
Group Editor: *Stuart Cooke*
News Editor: *Eric Doyle*
Advertisement Manager: *Paul Kavanagh*
Sales Executives: *Maria Wade, Tony Flanagan*
Ad-Copy Control: *Karen Bashford*
Artist: *Alan Lathwell*
Designer: *Mark Newton*
Origination: *Ebony*
Printers: *Chase Webb*

PC Show 1989

This year's *PC Show* was a gross disappointment for the record crowds that turned up to be stunned by the industry's Christmas fare. As each year goes by, more companies are abandoning the principle of showing computer games and getting hooked on cramming as many arcade machines into their smaller and smaller stands.

Ocean had an impressive position which formed the entrance to the leisure section of the hall. Fronted by two Fifties Cadillacs, the main feature was a video wall showing forthcoming attractions, including *The Untouchables*.

US Gold's crowd pleaser was an Outrun Ferrari, while *Mindscape* went for an early Harley Davidson – was this the alternative Motor Show?

Without a doubt, the show-stealer was *Domark's Hard Driving'*, a strong tip for the Christmas number one. This conversion of *Tengen's* coin-op has the added attraction of an action replay which allows you to relive the moment the car crumpled. The stunt track is particularly exhilerating.

This year the leisure section couldn't fill the area allotted to it. Many of the big players were either missing or represented by minimum-area stands. Where were *Mirrorsoft, Alternative* or *Code Masters?* You could be forgiven for missing *Microprose's* stand which could have been set up in a telephone booth – considering the size of the company it was an insult to their customers. Perhaps the booth was meant to attract attention to the company's take over of *Telecom*. At least *Activision* had a few *Ghostbusters* doing the rounds.

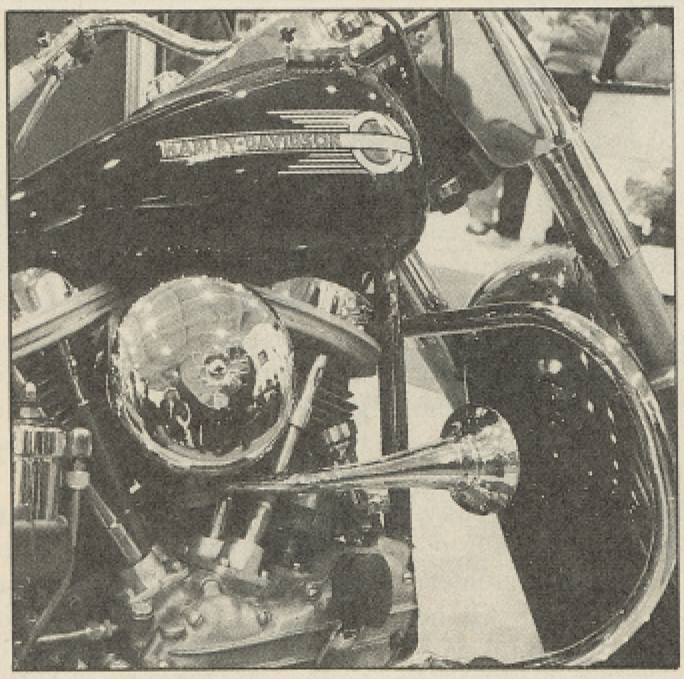
I think the effect of the whole Show could best be seen by the way the massive crush at lunchtime thinned out before mid-afternoon, and almost emptied an hour before the event closed.

Proof that there was nothing there to keep them interested.

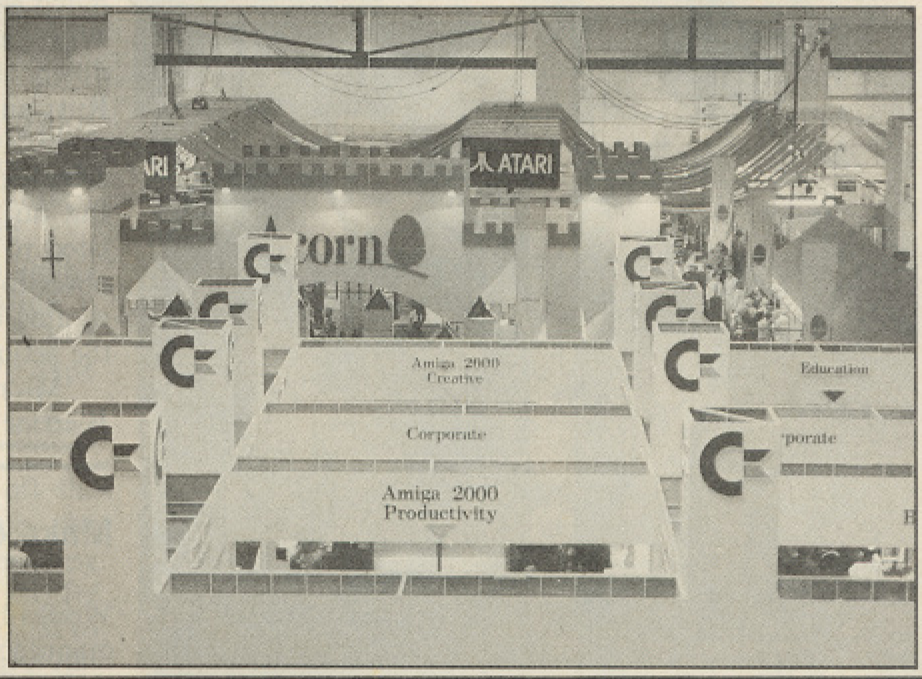
DATA



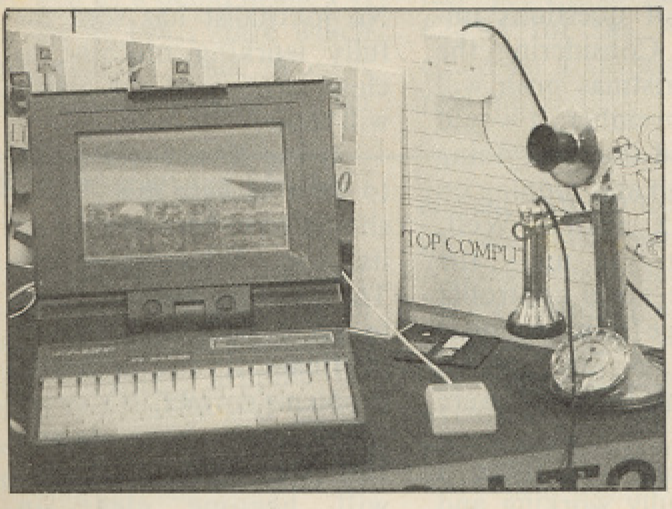
Below: Show me a show and I'll show you a show.

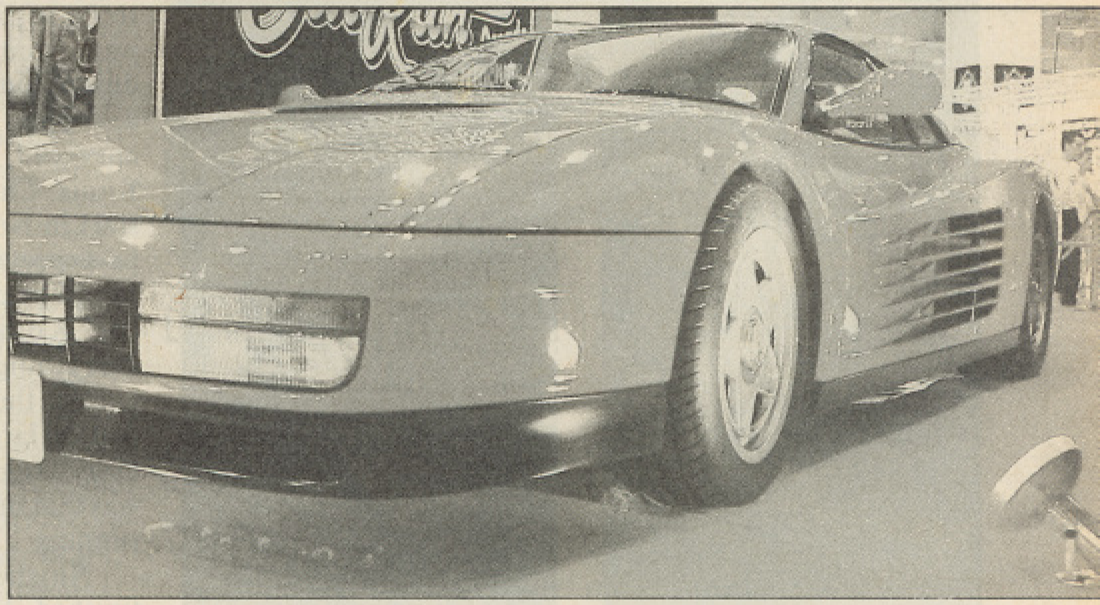


Below: The PC Show, an exhibition with more computers than a particularly well-endowed missile silo. Commodore were there, so were US Gold but both were over shadowed by the bar!









Show Wars

Who would have thought that this year's PC Show would be the last? Come to think of it, it *was* rather like a wake. Some of the glitter of its past glory was still there but it was as tarnished as last year's tinsel.

In the days when the event was known as the *Personal Computer World Show*, named after a magazine of the same name (in fact, both show and magazine were conceived in the Troubadour, a coffee house close to Earls Court) it was sponsored by publishers, VNU. At this year's Show a leaflet appeared, from a different publisher, advertising an event called *The European Computer Entertainment Show* which is booked into Earls Court for 13-16 September 1990 – the exact date of the next PC Show.

The question goes begging, what will happen to the PC Show? Has it disappeared without trace or will it still go ahead on another dat or at a new venue? VNU has gone awfully quiet but maybe that's a sign that something's going on behind the scenes.

Judging by the poor showing within the entertainment section at this year's show the new ECE Show could have problems even before it starts.

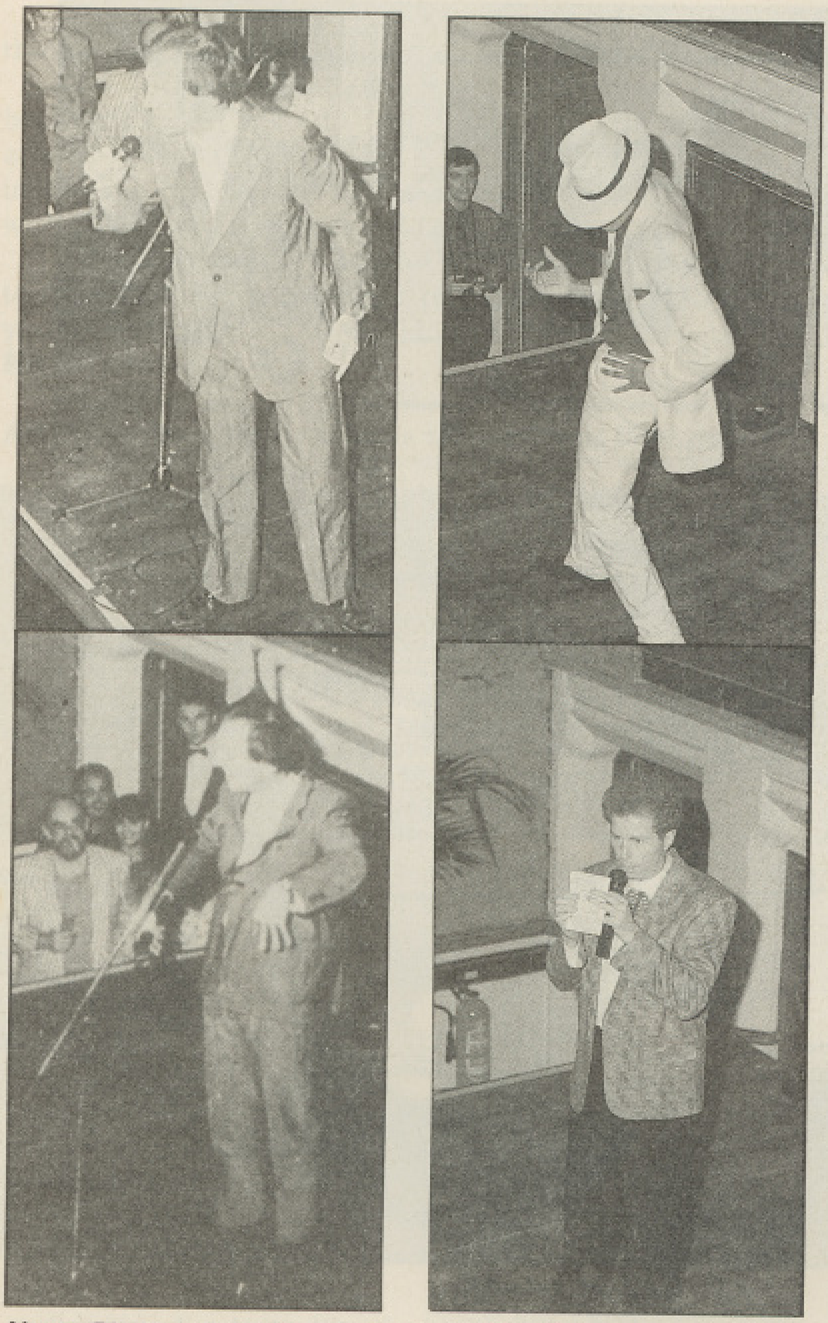
DATA

King Hell

Demonic is the only way to describe Rik Mayall's performance at *US Gold's VIP* sideshow. Every day, after the Show closes, the exhibitors hit the town for various alcoholic frolics. There's usually one event that stands head and shoulders above the others and this year it was US Gold's turn.

The select 'assembly at London's *Limelight* club were treated to a preview of US Gold's latest video (yawn) after which company boss Geoff Brown announced a personal appearance by Michael Jackson. Not THE Michael Jackson but a moonwalking clone from Deptford.

Then the Hallelujah Chorus hailed the appearance of the night's star turn. Nothing happened. Then the music reached a crescendo once more and amidst a series of thunderflashes, Mayall appeared with his hair laquered up into two



Above: Rik Mayall, Michael Jackson and Geoff Brown, all of which exercising their own brand of humour.

long horns. He then proceded to prove what a horny little devil he is with an act which was liberally sprinkled with words that would remove him from any bulletin board in the country. The performance was superb though it still needs to be tightened up to give maximum impact. Willy jokes and swearing are more the preserve of Bernard Manning than the laughing stock in trade of an alternative comedian.

If I remember nothing more about the Show it will be US Gold's evening treat.

What's the score?

Microprose boss, Major (Wild Bill) Stealey had a lot on his mind during the Show. Frantic nocturnal phone calls to the States as much as four times a night. Was the company going down the john? Had the Russians attacked Microprose HQ? Surely some disaster had beset the company. But no, his frantic calls related to his second greatest obsession, baseball! All he wanted was to keep up with the action as it happened.

Microprose's *Rainbow Warrior* has upset one of Greenpeace's international divisions. Company PR man, Martin Moth, couldn't remember whether it was Belgium or Scandinavia but the game, without sanction, is therefore banned. It appears that a magazine is now running a campaign to get Greenpeace to sanction the game so that it can be released.

This is a new situation for Microprose, normally its game get banned in certain countries because of their warmongering scenarios. To balance this they've entered the peace market and consequently get banned.

Make or Break

Would-be games machine manufacturers, *Konix*, seem to be getting plenty of support from the software industry but the Show leaves a couple of questions unanswered. Considering the Konix Christmas push will start in November, it would be expected that everything would be up and running on the Konix stand. Well, everything was up – the games, the novel controller and the large frame to mount everything on. The problem was that only the games were running.

Nowhere was there a finished, fully working and fully visible machine. The machines that were working were hidden in wooden boxes and controlled by conventional joysticks. The machine frames on display were apparently no more advanced than those on display in the early part of this year. No journalist has seen the fully working machine as close scrutiny of any article will show.

If the Konix was going to be a success this year it should have been seen in all its glory. What happened? The company has had a year to get it right are rumours of financial and technical problems correct? It's about time Konix boss, Wynn Holloway, came clean. All will become clear in November.

Utterly Daft

Every year, companies will try to attract the punters with personal appearances by showbiz personalities. To say that the high point was Timmy Mallet on the Atari stand gives some idea of the depths of in(s)anity that the Show has now reached.

As a crowd puller, Atari's coup worked. Timmy showed how utterly, utterly brilliant he is at beating kids on computer games and wearing those whacky outfits that will ensure that he never wins the best-dressed man of the year award.

DATA



Above: Wot no free software.



Above: I'm putting on my top hat!

One Good Nurd...

Who were the pillocks in the 'S**t on FAST' t-shirts? Why not wear a shirt that says 'Kill the industry'. What nurds.

In case you don't known, *FAST* is the *Federation Against Software Theft* whose primary aim is to prevent the organised ripping-off of software.

To turn up for an industry show while wearing a provocative slogan is just asking for trouble. We hope they found it.

Novagen's Damocles

Though absent from the Show, *Novagen* is about to release *Damocles*, the sequel to the magnificent *Mercenary*.

Damocles was first previewed as a demo at the PC Show in 1987, since which programmer Paul Woakes has been working hard to get the 3D flight game off the ground. In the game, the comet damocles is heading towards the planet Eris. By exploration the player has to discover the necessary objects to prevent the disaster.

The release date is definitely pre-Christmas and at £24.95 for the Amiga, it could be a surprise Christmas hit.



Above: The Level 9 fat cats.

Programmers Unite!

The *Society of Software Authors* (SSA) stand attracted a steady trickle of programmers, graphic artists, musicians and games designers who were curious to know what it was all about.

The SSA has been founded to serve the needs of professional software authors by giving advice, helping with problems and generally turning the rag tag industry into a professional body. Full membership costs £150 and is open to any author who has had at least one title published. For unpublished novices, the annual subscription is £50 for associate membership. Amongst the societies benefits are business guidelines to help with VAT, solicitors and money chasing, plus the excellently informative newsletter full of news, warnings, and professional equipment (hardware and software) reviews.

According to Mev Dinc, director of *Vivid Image Developments* and SSA member, the society has already attracted some of the big names in the industry but there's always room for more. Further details can be obtained from the SSA, 6 Callow Croft, Burbage, Wiltshire SN8 3TB.

Levelled Out

Britain's senior adventurers, *Level 9 Computing*, is pulling out of the adventure market after the release of *Scapeghost*.

According to L9 designer, Pete Austin, "People have been declaring the death of the adventure market for years so Scapeghost is an appropriate final release. It comes from beyond the grave."

The company has been producing adventures since 1981 and it is sad to see them go. Perhaps part of the problem lies way back when *Melbourne House* produced *The Hobbit* and took the software market by storm. L9 resisted following the new style of adding graphics to adventures, a concept pioneered by *Sierra Online* many years earlier. Since then *Magnetic Scrolls* has further advanced the popular adventure while L9 has maintained the opposing view that complexity of gameplay is the main thing.

Whatever the reason for the move, we thank Level 9 for hours of fun and we look forward to their new venture as an arcade-style games company using their new development kit, HUGE, for 16 bit programming.

THE BIG AND WOBBLY BUDGET COLUMN (OOER!)

Five cheapies on the new ENCORE label. Are they raves from the grave or should they be buried for ever? Gordon Hamlett takes a look

KOKOTONI WILF

This is the oldest of the six titles dating back to 1984 which, in terms of computer games, makes it practically a museum piece. The great magician Ulrich has discovered that there is an object in existence of such great power that he must posses it. Unfortunately, the fragments of the Dragon Amulet are scattered through the fabric of time itself and Ulrich is an old man.

Enter Wilf, his protege. You have been charged with recovering the various fragments for your master. The only help that he can give you is to fix a pair of wings to your back, allowing you to fly over the many hazards.

The game is divided into several time zones and you have to find a way through the cave system, collecting bits of the amulet until a time gate appears transporting you to another period of history.

The game involves little more than moving round the screen, avoiding bumping into the many obstacles. There isn't even any combat to keep you on your toes. Wilf is definitely beginning to show his age now. Everything about it is crude; the graphics, sound and gameplay. Unless you happen to be a nostalgia freak, you would probably do best to give this one a miss.



INFO

64

Overall:
28%

BOMBJACK II

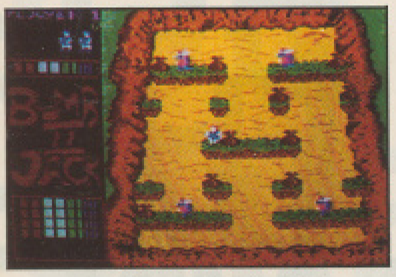
Imagine PacMan crossed with a platform game and you will have some sort of idea of what Bomb Jack II is all about. There are forty different screens – split between a reptile infested lava pit and outer space – each consisting of a number of platforms. On these platforms are a number of bombs to be collected but inevitably, they are protected by patrolling monsters.

Jack has to find a route round the platforms either dodging the baddies or repeatedly stabbing them until they disappear from the game. Wait too long and the lizard men in their various incarnations leave their regular patrols and start chasing round the screen. There are bonuses to be collected if you manage to defuse all your bombs in the specified order.

Unlike the original game, you cannot leap willy-nilly round the screen. Instead, you can only move sideways onto a platform on the same level, or up and down to one immediately above or below you. This means that not only does your timing have to be pretty good, but you also have to pay considerable attention to your intended route.

As far as the game goes, that just about sums it up. Despite some fuzzy graphics, Bomb Jack II is highly addictive and, if the sequel is not quite as good as the original, this is definitely the

best game in the collection and well worth considering.



INFO

64

Overall:

77%

STORM WARRIOR

This is the only game of the five previously unreleased, so the Encore label is something of a misnomer but never mind. You are the Crown Prince of your Kingdom and as such, are expected to rescue the land from a Wicked Witch's curse. She has summoned a violent thunderstorm destined to last for one hundred years unless you can do something about it.

Your ultimate aim is to find the witch's castle and destroy both her and the undead forces she commands. Before that final encounter you must battle your way through a forest, fighting off wariors and dinosaurs. The instructions don't actually tell you how to accomplish this, you must find out by trial and error although the moves are a fairly familiar assortment of somersaults, kicks and swipes with your sword.

Timing in the combat routines is not particularly important but where you stand on the screen is. If you stand too close to an opponent, you will miss him no matter how good your swordplay is. Kick him a few times to make him back off a bit.

Storm Warrior is not in the top division of beat-em-up games. The animation is poor and the battles lack the realism and excitement that would put them in the top league. An average game but then you get what you pay for.



INFO

64

Overall:

44%

TURBO ESPRIT

"Race your Lotus Esprit round the city chasing drug barons" claims the blurb. It is only when you get behind the controls of your car that you discover that it handles more like a Model T Ford as it chugs along.

Four smugglers' cars and an armoured vehicles are at large somewhere on the city's streets and it is up to you to find them. You must then take them out by either blasting them or continually bumping into them until they surrender. There are pedestrians and other innocent cars to avoid if you don't want to incur penalty points and you can also write your car off by driving into a brick wall. My favourite bit though is that you have to stop for traffic lights! Imagine it, a high speed chase, guns blazing and the lights suddenly turn to red. Do you really believe that everybody is going to stop and wait for them to turn to green again?

There are four cities to choose from, each laid out in typical American grid formation. You can call up a map to show your location as well as that of the enemy cars. Messages inform you that the armoured car has just been spotted on E19 or whatever. The problem is that you have to wait ages before you actually arrive on the scene. The balance of this game is all wrong.

Dreadful graphics, control and gameplay only serve to emphasise the faults inherent in Turbo Esprit. I didn't like it when it was first released and things have not improved with time.



INFO

64

Overall:

23%

DEEP STRIKE

The war in the skies over Europe in the First World War was supposed to be the last combat arena where chivalry played its part. Pilots frequently saluted each other before duelling to the death and it was not the done thing to gun down an opponent who had run out of ammunition.

Deep Strike quickly dispels all the myths! You are a single fighter pilot trying to escort four bombers on a vital mission. Pitted against you are the massed forces of the German Air Force – Von Richthofen himself, the Red Baron together with his squadron of triplanes. Then there are all the barrage balloons and some decidedly anachronistic tanks and field artillery, all trying to blast you out of the skies.

You can climb, dive and bank as you try to avoid the enemy. You have no sights on your plane so all shooting amounts to guesswork. That is if you want to shoot in the first place. You have a decidedly small amount of ammunition and should you decide to defend yourself to any great extent, you will find that you have run out of bullets before you are half way to your target.

This is a below average shoot-em-up and doesn't offer a great deal in the way of lasting appeal. If you are looking for this sort of World War One flying game, look out for a copy of Blue Max, the old US Gold game which is infinitely more playable.



INFO

64

Overall:

39%

PREVIEW

IT'S ALL IN THE MINDSCAPE

Roll up, roll up, all the fun of the fair. Well, not exactly fair, but a circus. Everybody is there, under the big top for what should be the greatest show on earth.

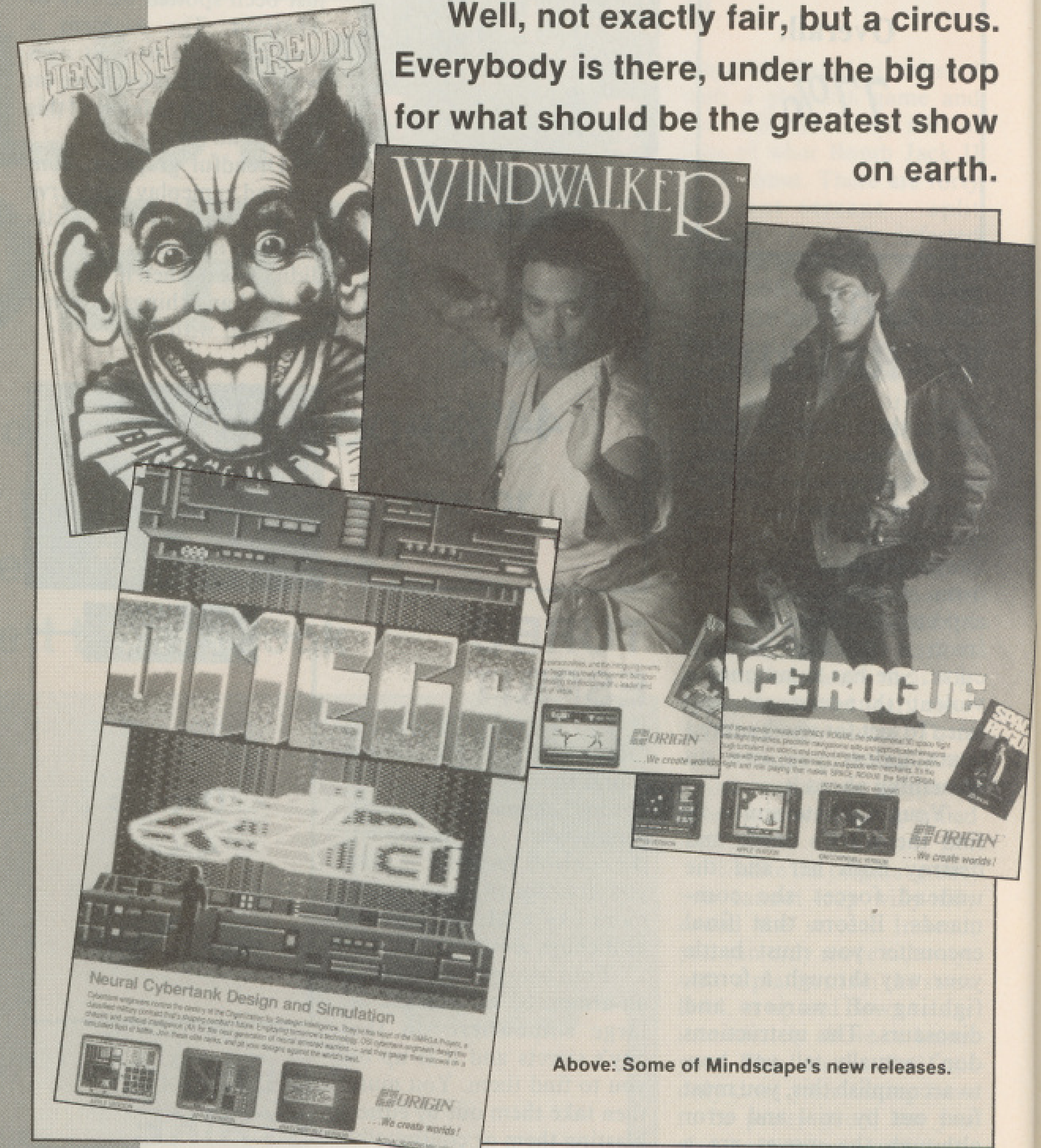
There you are, trying your hardest in six different events – juggling, knife throwing, tightrope walking, trapeze, high diving and human cannonball when you discover that someone is trying to sabotage your act.

Fiendish Freddy is out to get you. Who has employed him, nobody knows but he is definitely out to make your life a misery. Little things give it away such as waiting until you are sitting on your unicycle juggling such diverse objects as knives and babies before throwing you a bomb. And who is it who tries to hit you on the hand with a hammer when you are hanging on to a rope for dear life?

The graphics in **Fiendish Freddy** are superb – very high quality animated cartoons. If the idea of a custard pie in the face makes you fall about laughing, this could be just the game for you.

On a completely different tack, *Mindscape* are now responsible for *Origin's* games in this country and there are three new titles forthcoming on that label. **Windwalker** is a successor to **Moebius**, the Oriental fantasy role playing game that combined strategy with arcade beat-up-up action. This time, you must build up your character from that of a humble fisherman to martial arts expert.

Omega sees you trying to design the battle tank of the future. Apart from testing your creation in various battle simulations, you must also strive to introduce artificial intelligence into your latter day leviathan. The final game of this trilogy is **Space Rogue**, a science fiction role playing game. There is an entire universe to explore as you try to discover both legal and illegal ways of acquiring a fortune. Combat features solid 3-D graphics and there are many extra graphic sequences as well as a whole host of problems to be solved as you encounter space pirates, fly through shard storms and risk who knows what when you visit far flung mining outposts.

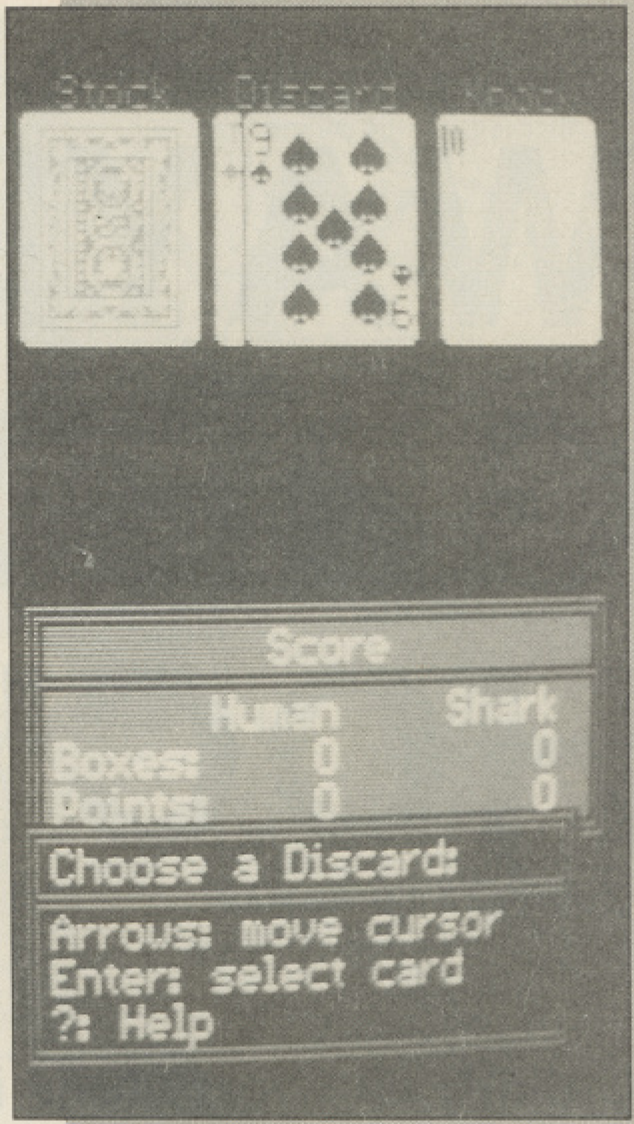


Above: Some of Mindscape's new releases.

Finally, it is not often that games exclusively for the P.C. get a mention in this magazine but **Beyond the Black Hole** offers a definite 'first'. Its scenario is little different from most 3-D shoot-em-ups but what is different is that it offers a stereoscopic view of the proceedings. Yes, you've guessed it, you have to wear a special pair of 3-D glasses while you play! All we want now is a machine that dispenses popcorn as well!

Gordon Hamlett

GIN KING/ CRIBBAGE KING



Software Toolworks (Mindscape) - £29.99 Disk

Gin and cribbage are two of the most popular card games. Here, at last, is a computer version that can be taken seriously.

If you want a break from the slaying of monsters and zapping of aliens then this double pack could be your answer. It contains an easy game system, tough computer opponents, even a pack of cards and a cribbage board.

Cribbage is one of the most popular card games and has often been computerised, indeed several listings for cribbage games have been included in the pages of this magazine; what makes this one different?

You can play two or four handed crib and you have seven different opponents each with their own style of playing. It also manages to cram the board, your cards and the play on the screen so you can follow exactly what's happening.

If Cribbage King is good, Gin King is a real surprise package. Its a game that doesn't immediately spring to mind. The game mechanics are simple but the play is very tricky thus combining to make it very addictive. (In just three days I played 87 games! I'd call that addictive). As with Cribbage King, the game features the same computer opponents that offer a range of different styles and strength of play; clear graphics that include full card designs; and a variety of options including duplicate play - so you can sent up the same hands and watch how another player would play them.

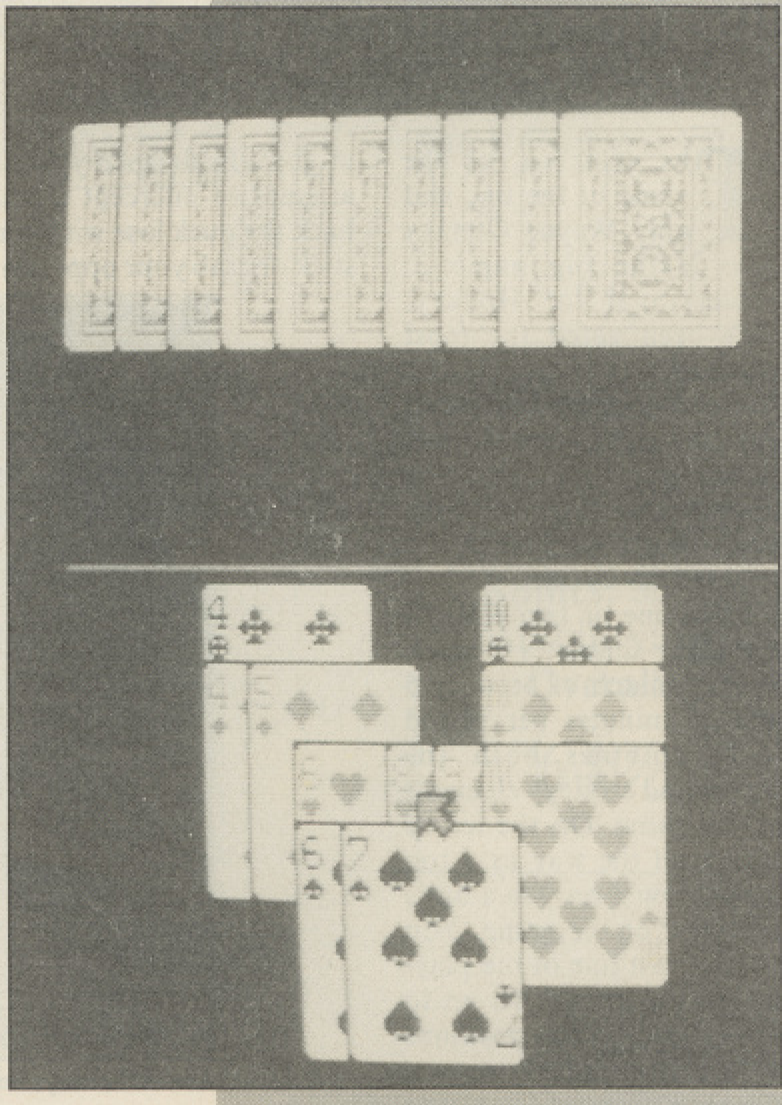
For a beginner the program offers full instructions, hints and tips, an easy opponent to get you going, and online help from any of the other computer players including basic strategy and specific help such as which cards to discard and why.

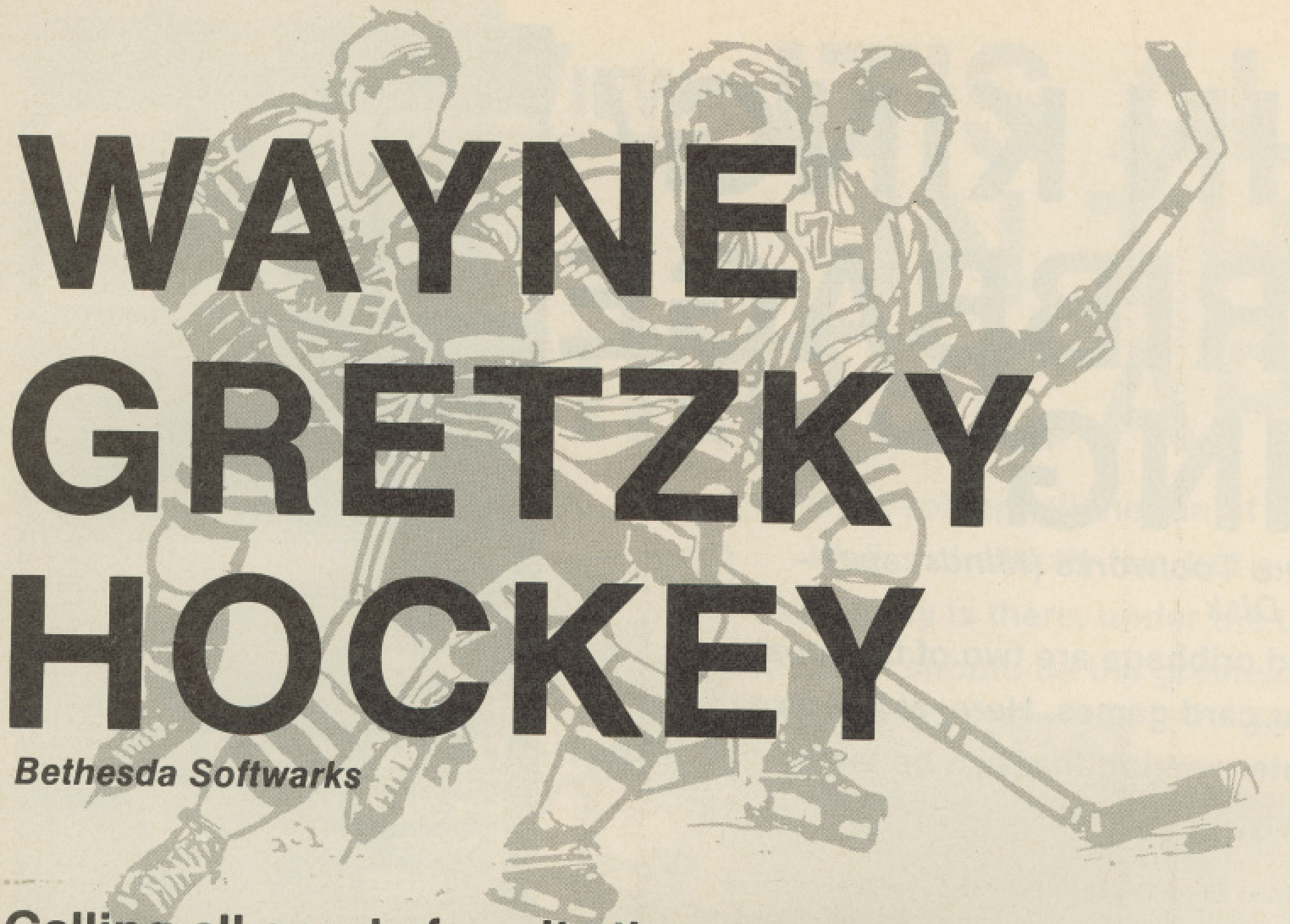
Without a doubt these are the definitive Crib and Gin programs and a must for all enthusiasts and addicts.

Tony Hetherington

INFO

Gameplay: 80%
Graphics: 65%
Sonics: N/A
Lastibility: 70%
Overall:
71%





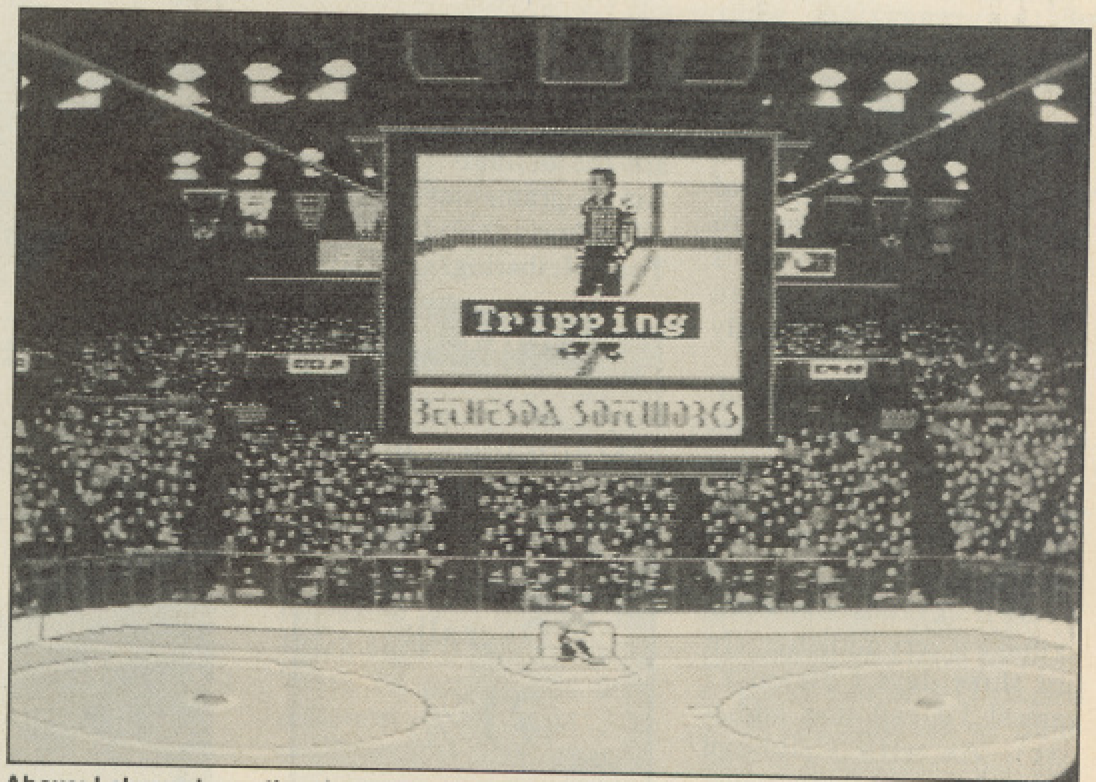
WAYNE GRETZKY HOCKEY

Bethesda Softwarks

Calling all sports fans its time to strap on your skates and grab your stick for this incredible ice hockey game.

The game carries the name of the one and only Wayne Gretzky who is the big name in professional Ice Hockey. He's been voted the most valuable player in the National Hockey League an amazing eight times. Unfortunately, he's all but unknown on this side of the pond so the game will have to stand on its own.

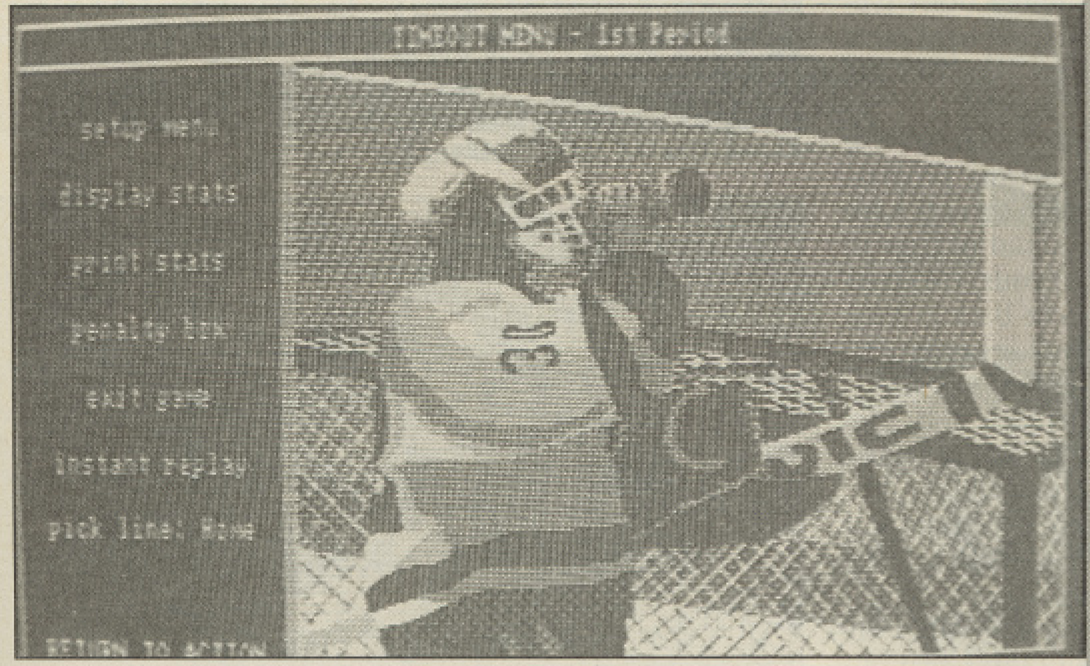
For one or two players, the game simulates a single hockey match of between 5 and 20 minutes per period and combines both the action and strategy elements of the game. On the ice its action all the way as a top down view gives you a birds eye view of the game. You control just one of the players on the ice and its up to you to get into free positions so your team-mates can pass the puck to your for a shot at goal. In defence you can attempt to intercept a pass, hack the puck lose with your stick or grab your opponents jersey to slow him down so that your team-mates have time to cover. Naturally, this is risky as there is a chance of a penalty for tripping or charging which may earn you two minutes in the penalty box.



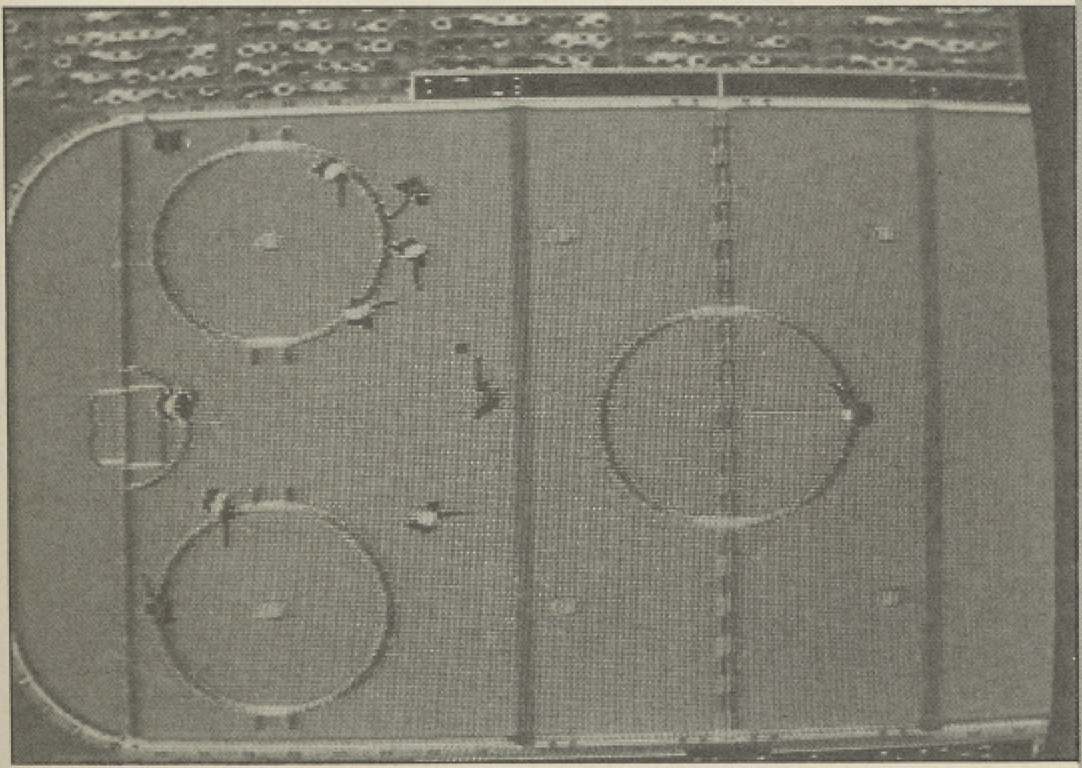
Above: I always knew the players were on illegal substances.



Above: "...And the invisible striker scores a splendid goal!"



Above: What's he drinking? Illegal substances no doubt!



Above: "...And the action is so frantic the crowd has awoken."

You can play the game at four different levels from high school to pro, that means the game will get faster, the players stronger and tougher. In fact, there's a chance when there's a penalty that a fight might start which is displayed for all the crowd to see on the above rink TV system. This system is also used by the referees to call penalties and for goal celebrations.

The action is only part of the game as good coaching or strategy can win a game. In this part of the game you must decide when to swap the team, or line, on ice for one of two substitute lines with different fitness levels and skills. You can also call one of five plays to send your team up the ice in a set formation or decide whether to attack or defend when you're short of a player due to a penalty.

Add to that lot, full player and team stats, sudden detah overtime and slow motion action replay and you have a cracking hockey game. The only drawback that I can see is that there isn't a league to play in although, I suppose, you could make up your own.

Tony Hetherington

INFO

Gameplay: 80%
Graphics: 70%
Sonics: 55%
Lastability: 50%
Overall:

64%

*This and other **Bethesda Softworks** games are imported into the UK by Active Sale and Marketing.*

SCAPEGHOST

Is it a ghost story? Is it a detective story? Gordon Hamlett takes on the part of Inspectre!

Level 9 Adventures, 19.95 Amiga. 14.95 C64 cassette and disk

You cannot remember how it was that you came to be at a funeral, nor whose it is. But when you sneak a look at the name on the card on the wreath you get the shock of your life. Although in these particular circumstances, that phrase can hardly be said to be apt. The funeral is your own!

You are, or rather were Alan Chance, an undercover policeman hot on the trail of a gang of drug smugglers. Someone or something went wrong though and the gang was tipped off. Only a chance encounter stopped your assistant from being similarly dispatched but she has now been taken prisoner. What really hurts though, is that your ex-colleagues at the funeral are blaming you for what happened. Can you clear your name in only three nights and also bring the criminals to justice? And all this when you are only a ghost!

As night falls, so you start to encounter some of your kindred spirits. The late publican soon befriends you and offers to show you round. The other ghosts would help you too but they have problems of their own; the colonel is worried about the vandals in the graveyard, a 'happily' married couple are bickering about who owns the wreath and so on.

As well as helping them, you have to learn about and practice your new ghostly skills – levitating objects, walking through walls etc. One of the problems is that you cannot carry very much in your ethereal state and so the manipulation of objects is not as straightforward as in other adventures. When you are struggling to hold on to a leaf, what hope is there that you can open stone coffins? Strong light causes you to weaken rapidly and as you progress in the game, so you encounter other typical undead problems such as how to get past running water.

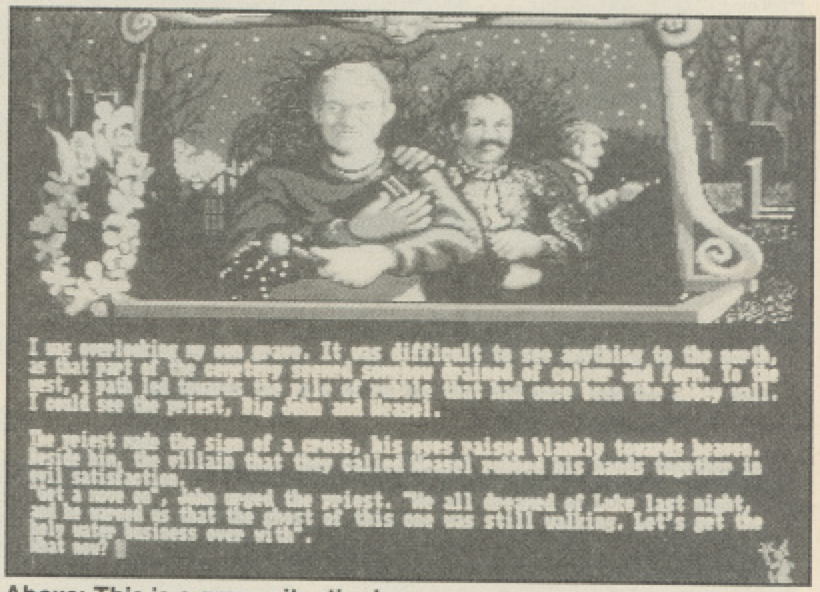
The game comes in three parts, each getting progressively harder. You only have a certain amount of time to accomplish your tasks as you have to be back in your new home before sunup. The game features *Level 9's* excellent parser and certainly, I had no difficulty with the vocabulary. The pictures are excellent and add very nicely to the atmosphere.

The story is wonderfully original and I think that this must be the best *Level 9* game for a long time. As it is to be their last adventure before trying their hand at something new, they have certainly managed to go out on a high note. Highly recommended.

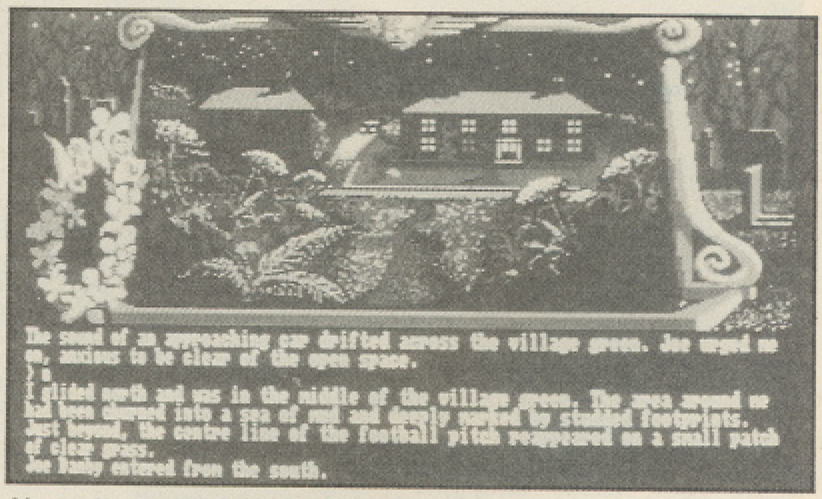
INFO

Gameplay: 88%
Graphics: 85%
Storyline: 92%
Lastability: 86%
Overall:

88%



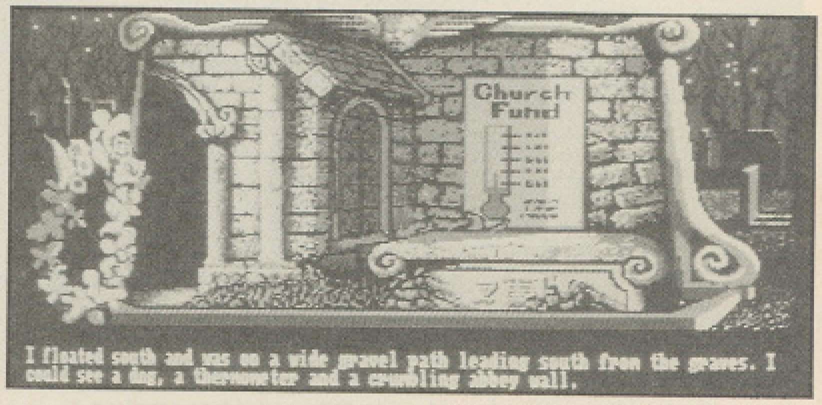
Above: This is a grave situation!



Above: I'm just dying to meet you.



Above: Smile, you're on Candid Camera!



Above: This must be Abbey Road.





TREBLE *Champions*

STUNNINGLY REALISTIC STRATEGY GAME

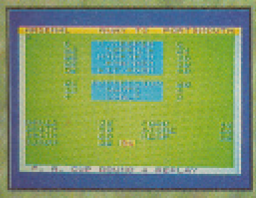
Can YOU Win the League Championship, The F.A. Cup and the League Cup?
An Amazing range of Realistic Features and Superb Gameplay combine to create all the Tension, Drama and Excitement of Football Management as you compete for Soccer Glory and THE TREBLE.
With the choice of 3 Skill Levels and the Option to Start in any of the 5 Divisions, TREBLE CHAMPIONS offers a Real Challenge to all Football/Strategy fans from the Beginner to the Expert.
"Treble Champions is possibly the most complete football strategy game to date... It is large, complex and, most importantly, addictive." OVERALL 88% Your Commodore.

CRICKET MASTER

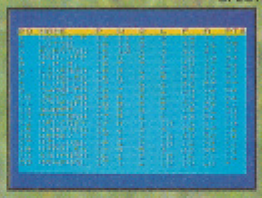
A SUPERB STRATEGY GAME

All the Action and Excitement of one day International Cricket is captured in this Amazingly Realistic Strategy Game.
As TEAM CAPTAIN you will be responsible for Team Selection and your teams Batting and Bowling Tactics, which you can vary from over to over to suit your Match Tactics and the Weather, Wicket and Outfield conditions.
With a Superb Range of Features, Options and Outstanding Gameplay, CRICKET MASTER lets you make the Tactical Decisions that will determine the outcome of each game.
Can YOU succeed in First Class Cricket and Captain your side to Victory against the World's Top Teams?

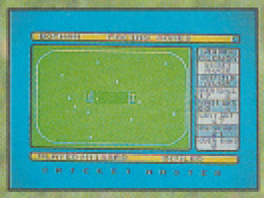
SPECTRUM SCREEN SHOTS

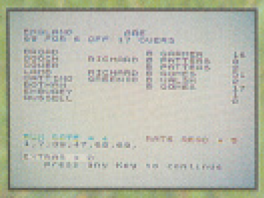

MATCH SCREEN – Full League Programme and F.A. Cup and League Cup.


SQUAD DETAILS – 100 Teams – Details of over 1500 individual players.


FULL LEAGUE TABLE and Results and League Tables for ALL 5 Divisions.


BATTING & BOWLING ANALYSIS


MATCH OVERVIEW & INFORMATION BOARD


SCOREBOARD & RUN RATES

Spectrum Tape £9.95 · Commodore Tape £9.95 · Amstrad Tape £9.95
Amstrad Disc £13.95 · Amiga and Atari Versions Coming Soon £19.95

Spectrum Tape £8.95 · Spectrum Disc £12.95 · Commodore Tape £8.95
Amstrad Tape £8.95 · Amstrad Disc £12.95

CHALLENGE SOFTWARE

NOW YOU'RE THINKING

Challenge Software: 37 Westmoor Road, Enfield, Middlesex EN3 7LE

TRADE ENQUIRIES WELCOME ON 01 443 1936.

LIKE A VIRGIN FOR XMAS?

PREVIEW

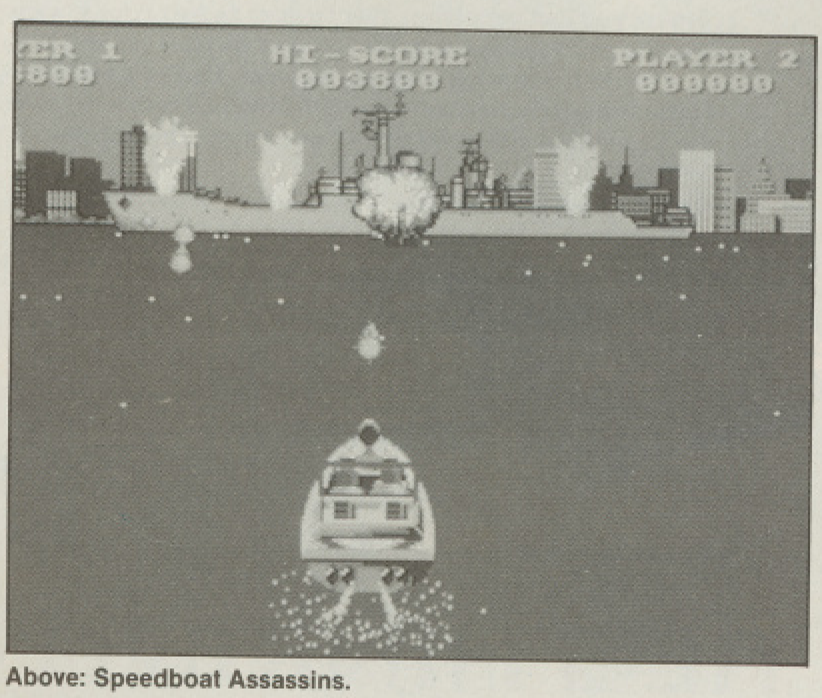
16 BLITZ MASTERTRONIC

Mastertronic has never been a respector of apple carts and, in keeping with its reputation for smashing budget prices, the PC Show saw yet another pile of pippins come tumbling down. At £4.99, the first of the aptly named **16 Blitz** games for the Amiga and PC look indistinguishable from some products costing four times the price. The first three games on this label are **Speedboat Assassins, Roadwars** and **T-bird**, with a future release schedule which includes *Activision's* **Little Computer People** and *Virgin's* **Sorcery+** on the Amiga plus *English Software's* **Knight Games** on the PC.

Despite its watery setting, Speedboat Assassins is a 'roadrace' game which wets on the likes of Fire and err...oh yes, Forget. The roadrace element means steering a highly responsive and nippy little speedboat, running the gauntlet along a narrow channel lined by some wicked-looking mines – but success here leads on to pitched battles later. A better name for the game would be Speedboat Saboteur, as the future screens lead on to higher levels of technological carnage.



Above: The Blitz boys; Ron, Ron and Ron.



Above: Speedboat Assassins.

How such a heavily armed speedboat can maintain its high velocity attack, or even stay afloat, remains a mystery. Barring accidents, it manages to defy the Laws of Physics as it blasts enemy boats into driftwood, mangles telecommunications towers and even moves in to scuttle a few battleships.

Sometimes its amazing how real events can mirror a battle like this. When Virgin Games concluded their take over of the Mastertronic stable, shortly after the 1988 PC Show, it was rather like Captain Ahab

swallowing Moby Dick whole. Not that Virgin didn't have a good reputation, but their games organisation was hardly on the same scale as mastertronic's empire which ecompassed its range of budget labels, **Melbourne House**, a (then) new deal to market the Sega games system, and a flirtation with the video market.

Today Frank Herman, the man who loomed large in the company's creation of the budget market, still champions Mastertronic's cause, assisted by his old mate Alan Sharam. Now, with their abilities combined with Virgin Games' boss, Nick Alexander, Virgin Mastertronic has a new vitality.

Virgin Games hadn't really done very much since **Dan Dare** but it blossomed earlier this year with the brilliant **Silkworm** and the highly successful **Double Dragon**. More fruits are now starting to appear in time for the Christmas consumers and **Double Dragon II** is spearheading the attack.

At the end of Double Dragon, Billy and Jimmy Lee made Marion a free woman again, but her captors, the Black Warriors were not totally eliminated. One member escaped and she, with her new Tong, have dispatched Marion to that great pagoda in the sky. Billy and Jimmy are a bit peeved off and have sworn revenge and will be out for vengeance in November. Eight bit or 16 bit, the choice is yours.

Taito's **Ninja Warriors** is another Ninja binger currently in the Virgin Mastertronic pipeline and due for release in December. Rebel leader, Marc, has built two Ninja robots to defeat the world's latest dictator, Bangler. These Ninja Warriors are under your control as they make bangler's criminal army see stars (little, pointed metal ones). Can I save the world – sure I can.

Continental Circus has nothing to do with jugglers but, from what I saw at the Show, you do need a lot of balls to get through this roadrace. As race games go it has little to lead me to recommend it over the hordes of games of this genre. As good as some, better than many, it will have a hard time battling against Domark's excellent **Hard Driving'** or the reputation preceding the launch of US Gold's **Outrun II.**

By far the biggest news from the Virgin Mastertronic stand at the Show was their Christmas Coin-op Collection Competition. With prizes totalling £30,000, it's the biggest gamble that the company has ever taken – either before or after the take over.

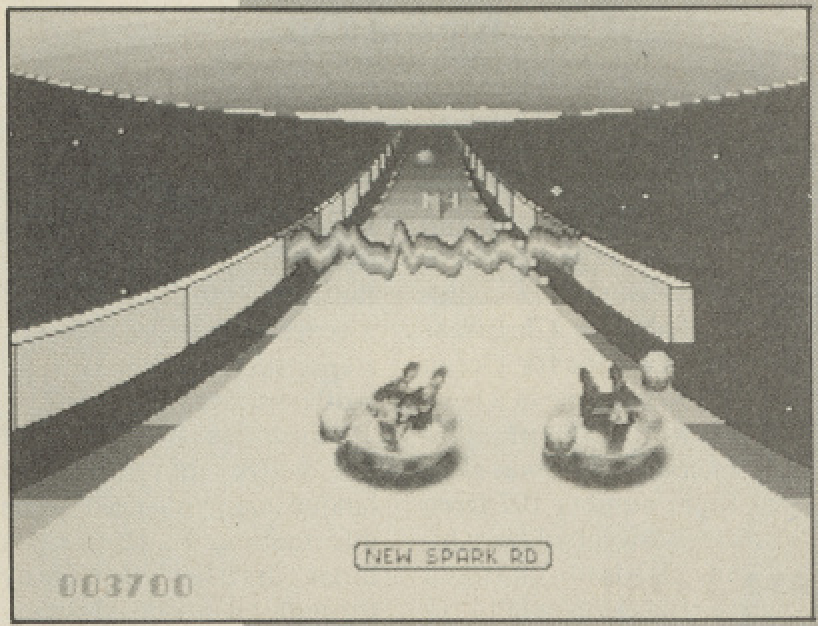
The competition is based around Virgin Games Silkworm, Gemini Wing, Shinobi, Continental Circus, Double Dragon II and Ninja Warriors. To qualify, tokens must be collected from any three of these games before January 1990. Submitting the game and answering a 'simple' question puts an entry in the grand draw and the five winners will each receive £1,000 worth of their chosen software (not necessarily Virgin Mastertronic stock), or £500 worth of software plus an Amiga for the intelligent or an Atari ST for those who don't recognise a bargain when they see one – by the way, I noticed one friendly loon at the show scrawled 'HI' between the S and T of the Atari logo. Although we don't condone such disgraceful behaviour – good on yer, sport. And to show no ill intent against Atari, what do you call Silkworm on the ST? Virgin on the ridiculous.

The rest of the prize money for the competition comprises 10 second prizes of £500 of software and £250 worth for each of the 20 third prize winners.

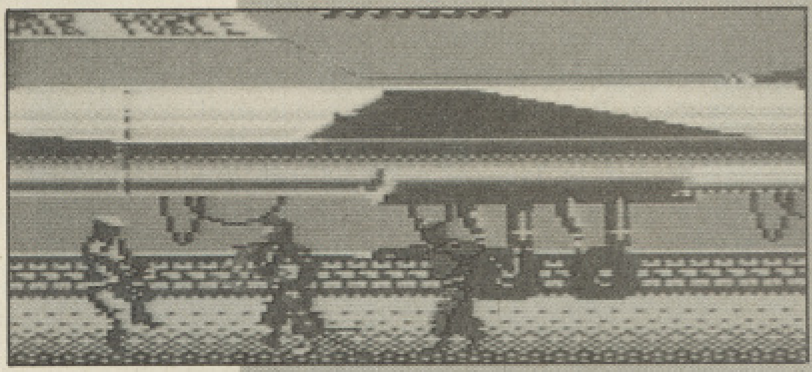
Elsewhere in Virgin's Vernon Yard HQ, Melbourne House and Leisure Genius are still chugging away. Looking like Double Dragon on dope, Cyst, sorry, **Fist II** is about to appear on Mastertronic at a realistic price of £2.99, while Melbourne House pursues its current trned for fantasy role playing and graphic adventures with **Demon's Tomb** and **Grimblood** plus the conclusion to the bloody grim **Lord of the Rings** trilogy as Frodo and Sam plod on towards the War in Middle Earth.

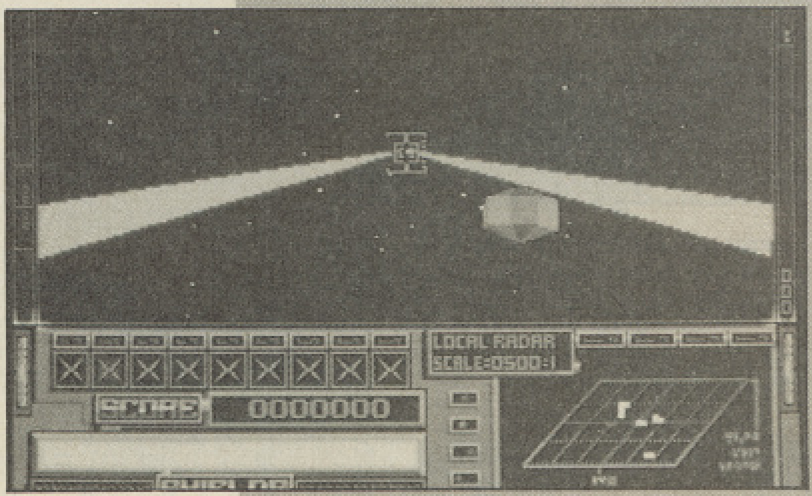
Leisure Genius sounds much more hopeful with their trilogy. **Monopoly, Scrabble** and **Cluedo** for a combined price of £19.95 (C64 only). There is also the promise that my favourite board game **Risk!** will soon be appearing. Ah! World domination isn't that what life's about?

Incidentally, you may have heard that 1990 is the latest nominee for the Year of the Games Machine – whatever happened to them in 1989? Consequently, the Virgin Mastertronic stockrooms are frantically being loaded with Sega games which sounds like the storm before the calm to me.



Above: Roadwars


Above: Ninja Warriors



Above: Kelly X

OPERATION THUNDERBOLT

Ocean – £9.99

The sequel to last year's Christmas number one leads Ocean's challenge for the top.

Operation Thunderbolt is the sequel to the chart topping Operation Wolf. It is already a big hit in the arcades and aims to repeat the success of its predecessor, thus claiming the lucrative Christmas number one spot for Ocean for the second time in a row.

When the reports first started coming in it was clear that flight number 102 from Paris to Boston had been hijacked. It had changed course for somewhere in Africa and information received reveals that the plane has landed in hostile territory and the terrorists have issued their demands.

Weary from your last Operation Wolf mission you are persuaded to launch a rescue mission, only this time you don't have to go alone as you can take one of your buddies with you. Which is just as well as this is going to be a tough mission behind enemy lines. So the game actually consists of a series of small missions or stages that lead to the final battle onboard flight 102.

Your first task is to find out where the plane had landed and you need some information. To get this you must battle your way through an array of enemy troops (that fire guns and hurl grenades and knives at you) until you can meet up with your contact who will direct you to mission two – which is an attempt to attack and seize the enemy's supply and arms dump.

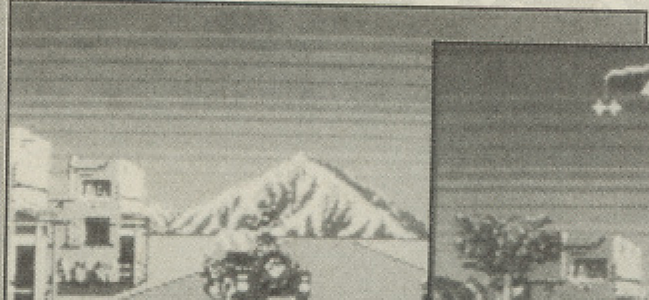
Eventually, you will board the plane and engage in a pitch battle with the terrorists who use the seats as cover. Your only hope is to fight your way to the flight deck and hope the pilot survives the battle, so he can fly you and the hostages to safety.

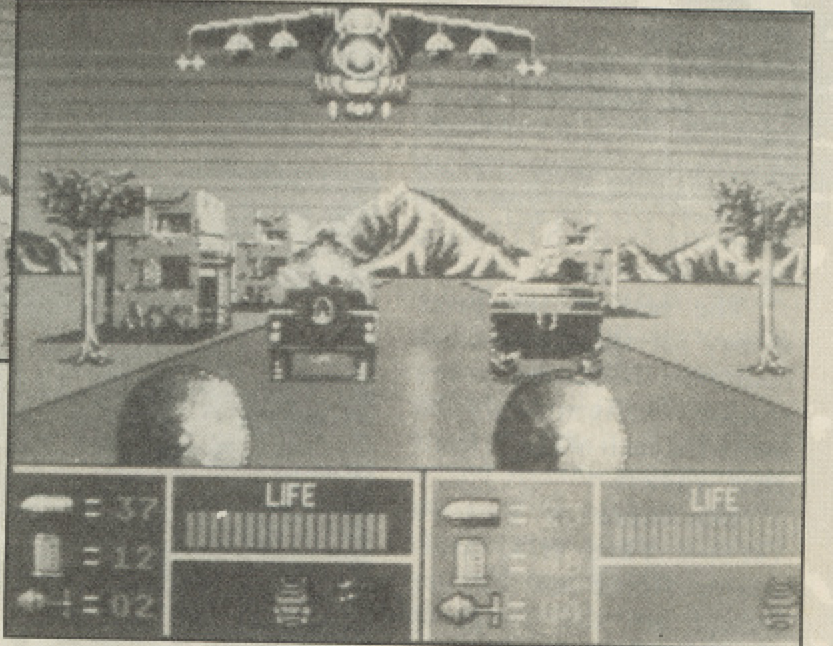
Operation Thunderbolt has many things in common with its prequel but also boasts a whole new range of action features. Secnes and missions alternate between Op Wolf style sideways scrolling screens and the new 3D views where you fight as you move into the screen. The troops, tanks, paratroopers and helicopters of Op Wolf are back in action, but they are also joined by jet fighters and new weapons (including rocket launchers and knives) to dodge and destroy. The players still have a limited number of machine gun cartridges and grenades that can be topped up by collecting supplies, and you can also collect new equipment such as a laser sight for increased accuracy and a bullet proof vest to save your dwindling force.

The biggest single difference to the game is the addition of a second player that not only doubles your firepower against the enemy but also produces incredible rivalry as shot to hit percentages are compared and supplies and equipment are vied for.

Look out for this one as Operation Thunderbolt is going to be a monster hit.

Tony Hetherington





Above and right: Nuke 'em, nuke 'em, nuke 'em, nuke 'em, nuke 'em, nuke 'em!

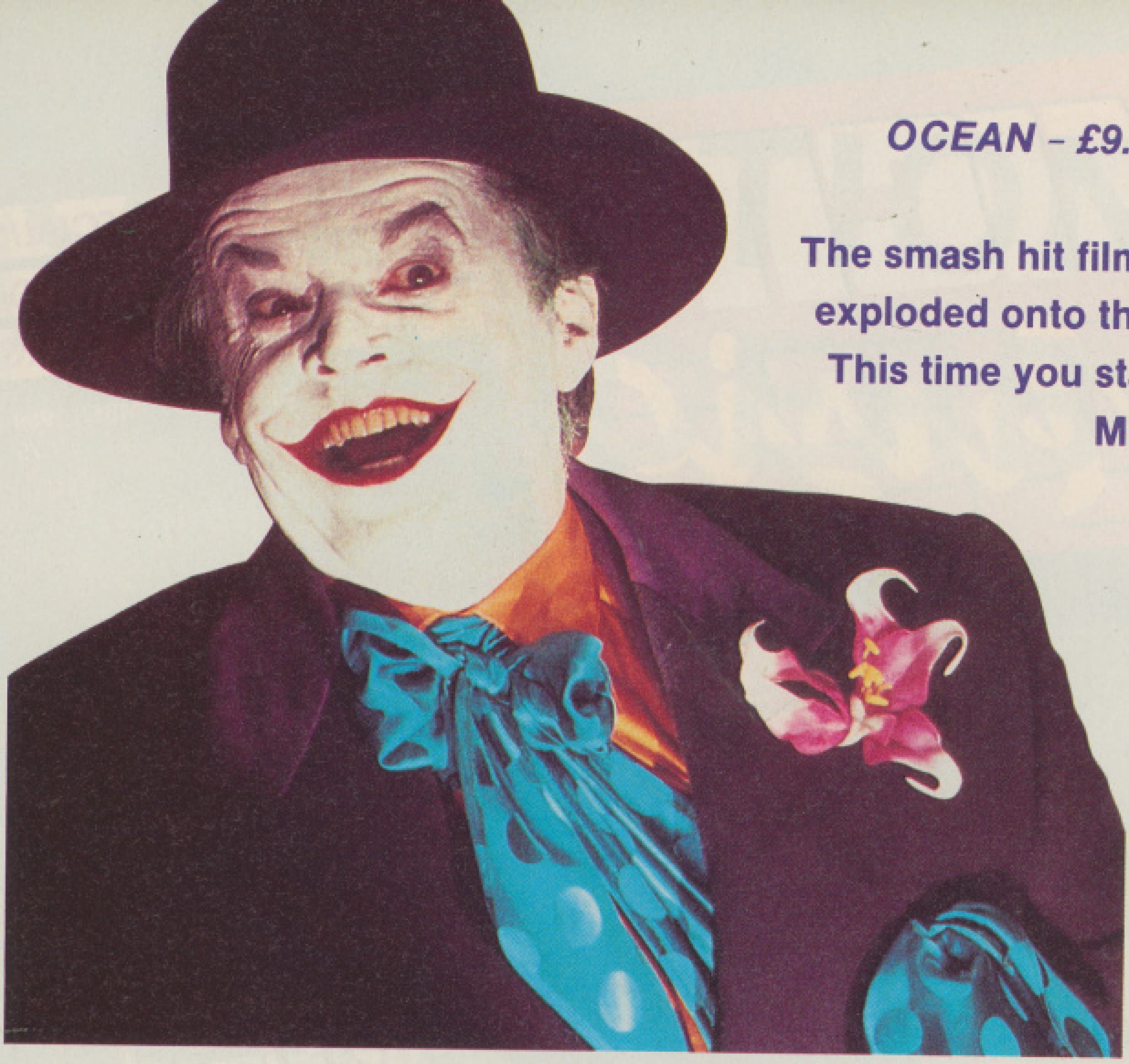
INFO

Gameplay: 85%
Graphics: 88%
Sonics: 65%
Lastibility: 85%
Overall:

81%

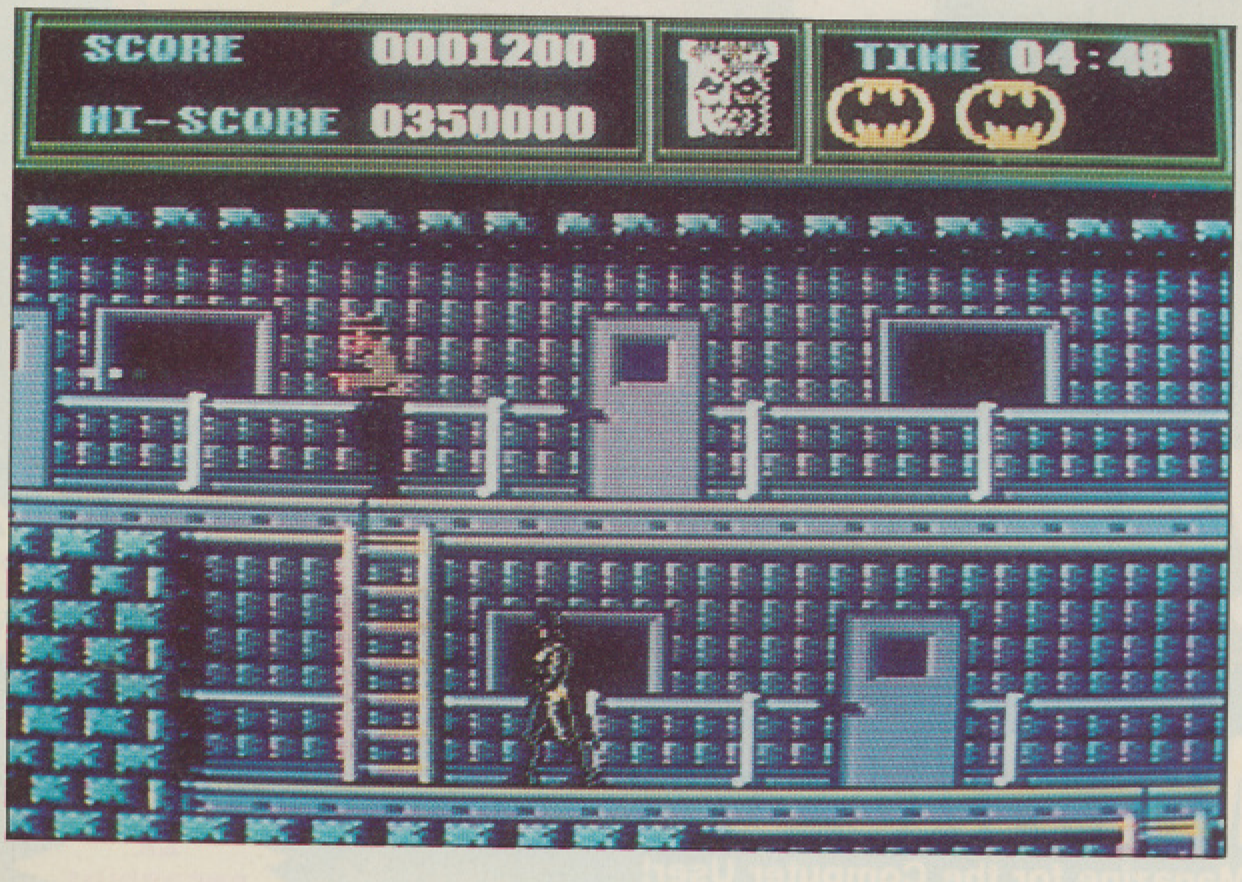
__Ocean__ boasts an impressive line up for this Christmas, including Batman, Cabal and the remarkable Untouchables.

OCEAN – £9.99 / £12.99 disk



The smash hit film of the Summer has exploded onto the computer screen. This time you star in Batman – The Movie.

BATMAN THE MOVIE



By day multi-millionaire Bruce Wayne is the mild mannered head of the Wayne Foundation but at night, when evil stalks the streets of Gotham City, he becomes the sinister masked vigilante known only as Batman.

Crusading against crime from the rooftops of the sickened city, Batman's main aim is to eliminate Gus Grissom's criminal empire and in particular Jack Napier, his psychotic second in command who, following an accident in his own chemical factory, becomes twisted both mentally and physically, and transfroms into the Joker. Your battle with the Joker takes you through five stages of the game that follow scenes from the hit movie.

The Axis chemical plant is the setting for the first stage, in which you must negotiate the network of ladders and ramps with help from your Batrope, and fight the Joker's henchmen with your Batarang. It is on the final scene of this level where Jack Napier falls into a vat of chemicals and becomes the Joker.

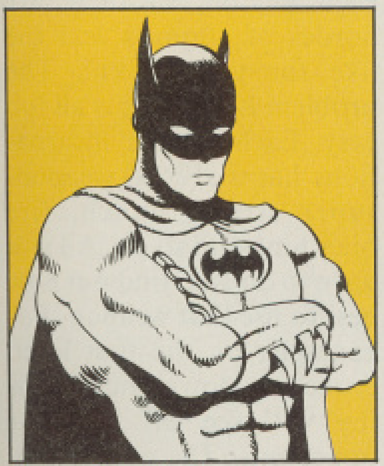
In scene two you have just rescued Vicky Vale from the clutches of the Joker and are making good your escape. However, this isn't going to be easy as you not only have to avoid the Joker's men, but also the police cars and road blocks. Drive fast, and follow the directions highlighted by the Batdirectional computer.

Left: You too can dress as Bernard Manning and fight crime as Fatman.



Above: I wonder if the Batmobile has a sticker in the rear window that says "my other car's a Skoda!"?

Meanwhile, back at the Batcave. The caped crusader has just 60 seconds to discover which three household items contain the compounds that combine to form the Joker's deadly Smilex which kills on contact. Level four takes you back onto the streets of Gotham City only this time in the Batwing. The Joker has massive balloons full of Smilex gas that he is about to release on unsuspecting crowds. Your task is to use the Batwing to cut the ropes that secure these balloons so they float off harmlessly. However, one wrong move and the balloons could burst and hundreds could die.



Above: Stop the Press!

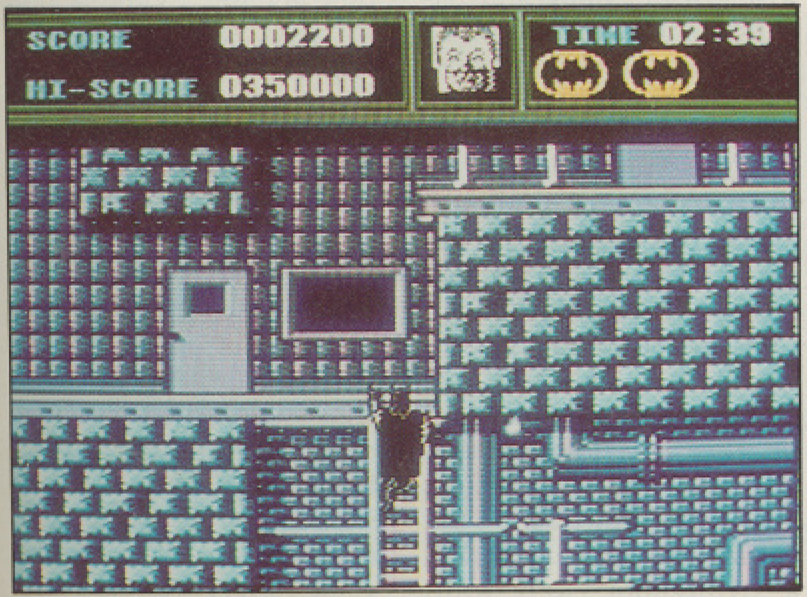
The final duel between Batman and the Joker comes at the top of Gotham City cathedral. This is similar to the first encounter in level one except our hero must also watch out for crumbling floors and rapid rats.

With the film's success behind it the game cannot fail. However, under the hype, costume and drama it is simply a shoot-em-up with two platform game elements and, in level 3, a Mastermind.

Tony Hetherington

INFO

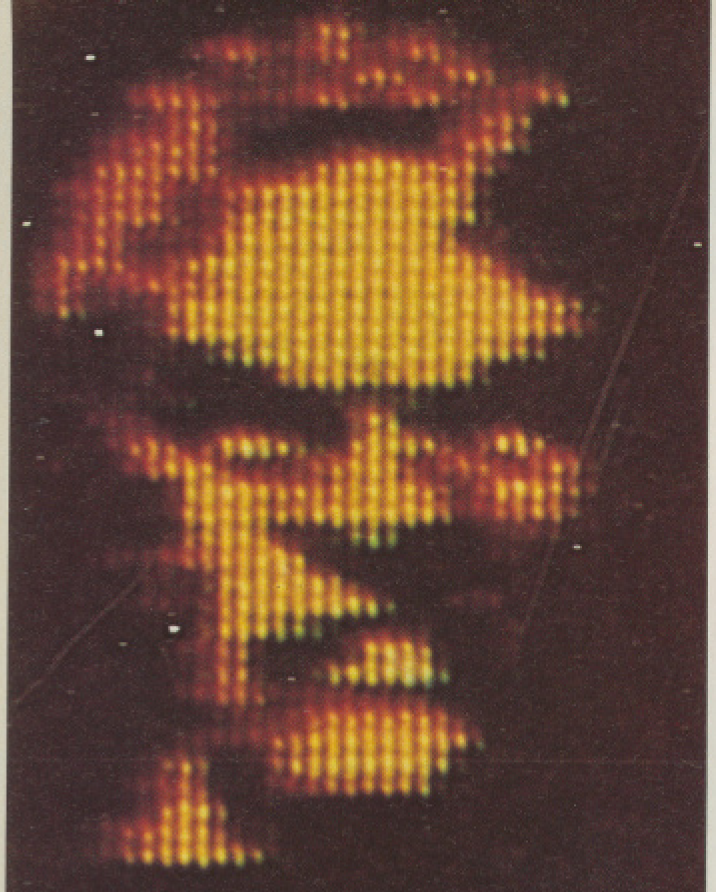
Gameplay: 55%
Graphics: 65%
Sonics: 50%
Lastibility: 55%
Overall:
56%



Above: Batman's got a ladder in his tights.



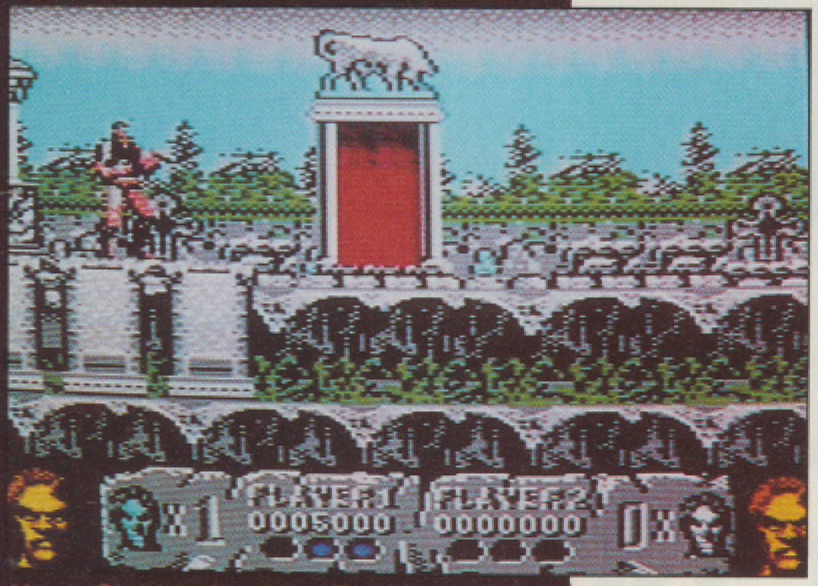
Above: If a cow pooped on his head, he'd be Patman!



ALTERED BEAST

Activision - C64 - £14.99 £9.99 disk/ cassette

Gordon Hamlett waits for a full moon before taking a look at Activision's lates release.



Above: Ooo, you beasty you!



Above: Beating and maiming! Maiming and beating!

INFO

Gameplay: 40%
Graphics: 35%
Sonics: 40%
Lastability: 30%
Overall:
36%



Above: What a large throne. I wonder if the urinal is as big.

Mummy! Mummy! What's a werewolf? Shut up and comb your face! It is a well known fact that the Gods on Mount Olympus did not always live a life of perfect harmony. Indeed, they seemed to be constantly at loggerheads with one another. The only advantage was that being gods, they didn't actually have to get their own hands dirty. Instead, they would just toss a few thunderbolts around and influence the lives of a couple of mortals to go and do their dirty work for them.

Anyway, it appears that the goddess Athena (should be Athene) has got herself captured by Nelf the Evil Lord of the Underworld (why invent a name? What's wrong with calling him Dis or Pluto?). Zeus decides to rescue her but instead of doing it himself, empowers you, a dead centurion, (note the subtle switch from Greek to Roman mythology – methings that whoever wrote this was not a classicist) with the strength of some of the most fearsome beasts in the kingdom.

So it is that you embark on this adventure, shapeshifting as you become more and more powerful. Your various guises include that of a strongman, were-wolf, bear, were-dragon, were-tiger and golden wolfman.

Despite my mocking it, the storyline sounds reasonably inventive. It is only when you actually start to play the game, that you realise that you've been here before. Yes, the game is yet another beat-em-up, and not a very good one at that.

As you wander along each section, so there are hordes of zombies and the like for you to kill. The problem is that this is all too easy. Each of your incarnations has a special weapon-super strong punch, fire breathing and so on. All you have to do is to find out how best to use that weapon. For example, on the first level, crouching down and punching will see off all your opponents. The only exception are the creatures that spring at you. These are the important ones, since when you destroy one of these, they release a 'spirit ball' which bounces round the screen. Catching this effects your metamorphosis.

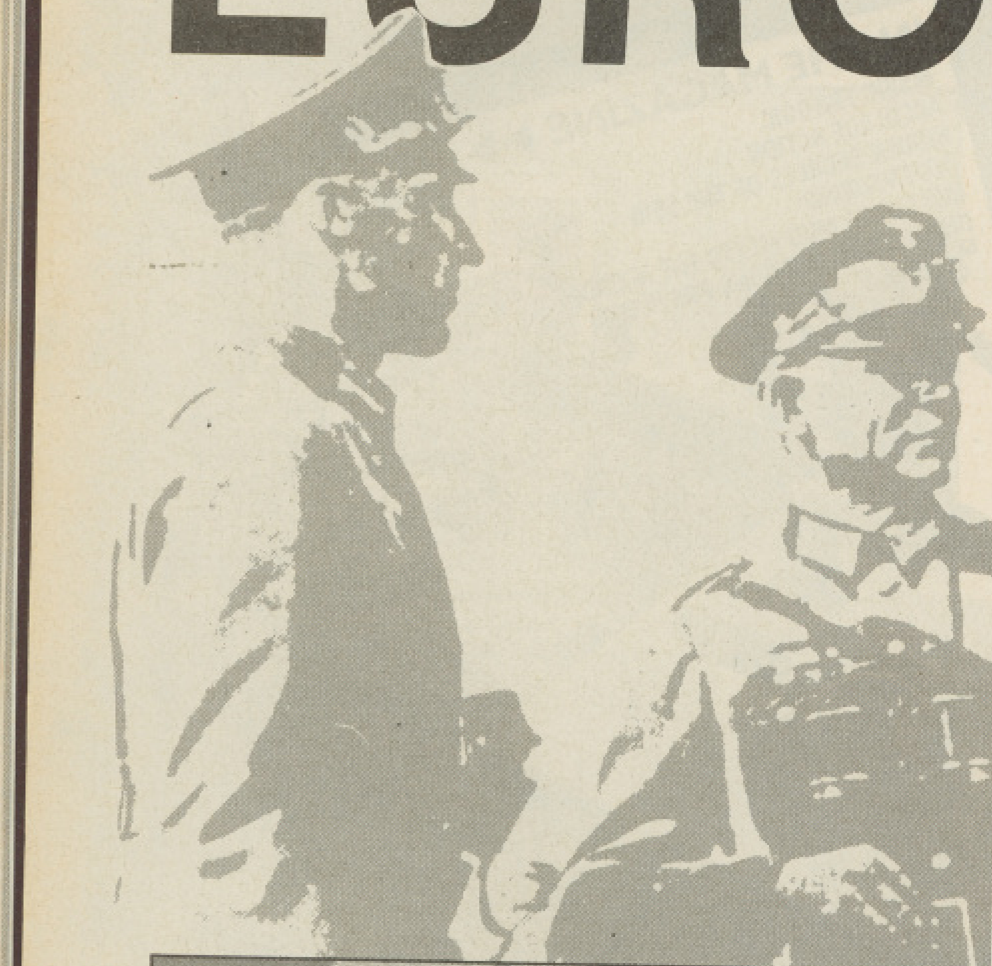
The rest of the game is pretty dire too. The graphics are dreadful – very fuzzy and unclear. Scrolling too leaves a lot to be desired. You sped most of the game on the right hand edge of the screen waiting for the background to catch up. All in all, this game's a very poor effort and should be left well alone.


GREAT NEWS
NOW MONTHLY!
COMMODORE
NEW
FOR THE C64, C128 USERS
UTILITIES
DISK LIBRARIAN
DISK MATE
TEXT CRACKER
NOLUXE PAINT
C128 RAM DISK
GAMES
DISK ADVENTURING
SHOOT 'EM UP
CONSTRUCTION
KIT REVIEWED
COMMODORE Disk User
CDU PAINT
DEVAID
OPCODE SCANNER
DOMINOES
BAZAIR
ARAKNIFOE
SOFTWARE WORTH
AT LEAST
£50
COMMODORE Disk User
IN THE MAGAZINE ▶▶
INSIDE TRILOGIC
ACCOLADE ACTION
HIDDEN SECRETS OF THE 6510
ADVENTURING:
MULTIUSER MUD MEETS THE MICRO
DUNGEONS & DRAGONS PREVIEWED
NOVEMBER ISSUE
ON SALE
OCTOBER 20TH
COMMODORE DISK USER is what you have been waiting for — take out a subscription TODAY!
COMMODORE DISK USER IS A LOT MORE THAN JUST ANOTHER COMPUTER MAGAZINE. EVERY ISSUE CARRIES A DISKETTE CONTAINING MORE THAN £50 WORTH OF SOFTWARE RANGING FROM SERIOUS PROGRAMMING UTILITIES TO ARCADE GAMES. THERE ARE PLENTY OF COMMODORE MAGAZINES ON THE MARKET, BUT WE BELIEVE THAT THIS IS THE FIRST TO CATER FOR DISK USERS OF ALL AGES AND TASTES.
Get in on the action

STORM ACROSS EUROPE

SSI – £24.99 Disk

50 years ago Hitler unleashed a storm of destruction across Europe. Now you can simulate the entire war in a few hours.



September 1939, Hitler launched his blitzkrieg invasion of Poland that triggered the Second World War. Now up to three players can recreate the battles and problems of that era in one of the most playable SSI wargames. In a solo game you control the forces of the Reich against Allied and Russian forces controlled by computer, which can be replaced by humans if they are available.

As commander in chief you must not only organise your troops in battle, but also manage your limited resources of population, raw materials, and industry to both research new weapons and produce the land sea and air forces that will be required to win the war. These resources are gained by conquering territories during the four three-month turns in a year and assigned in Spring to research projects and production.

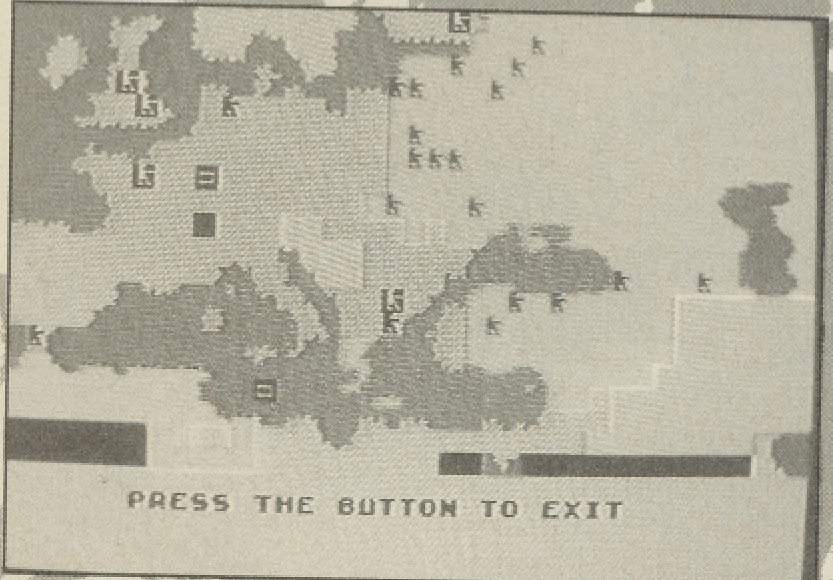
Through research you can increase the effectiveness of land units, including tanks, troops, supply trucks and paratroopers, naval forces (ie. submarines), fleets, escorts and landing craft, and the fighters and bombers of the air force. You can also develop new weapons, such as missiles and nuclear weapons.

In a turn you can move your troops around your empire, send your subs to raid enemy shipping, launch an amphibious invasion, try and break through an enemy position, and send your bombers (complete with fighter escort) to bomb either enemy aircraft or production.

The program contains several secnarios and variables that can be set to create a variety of challenges, not only providing a strategic challenge but also an insight into the war – such as how vulnerable Britain was to invasion in 1942 and the horrendous losses inflicted on both sides when Germany attacked Russia.

The game manages to provide historical accuracy in a playable form which should appeal to more than the hardened band of hex wargamers. For example, instead of having to occupy every province of a country to conquer it you only need to occupy key areas such as Paris and Marseilles for France and only Warsaw to defeat Poland.

Tony Hetherington



Above: "Yes, let's all press the button..." – Ronald Reagan, 1987

ch you
iveness
luding
trucks
val for-
fleets,
craft,
and
force.
p new
nissiles

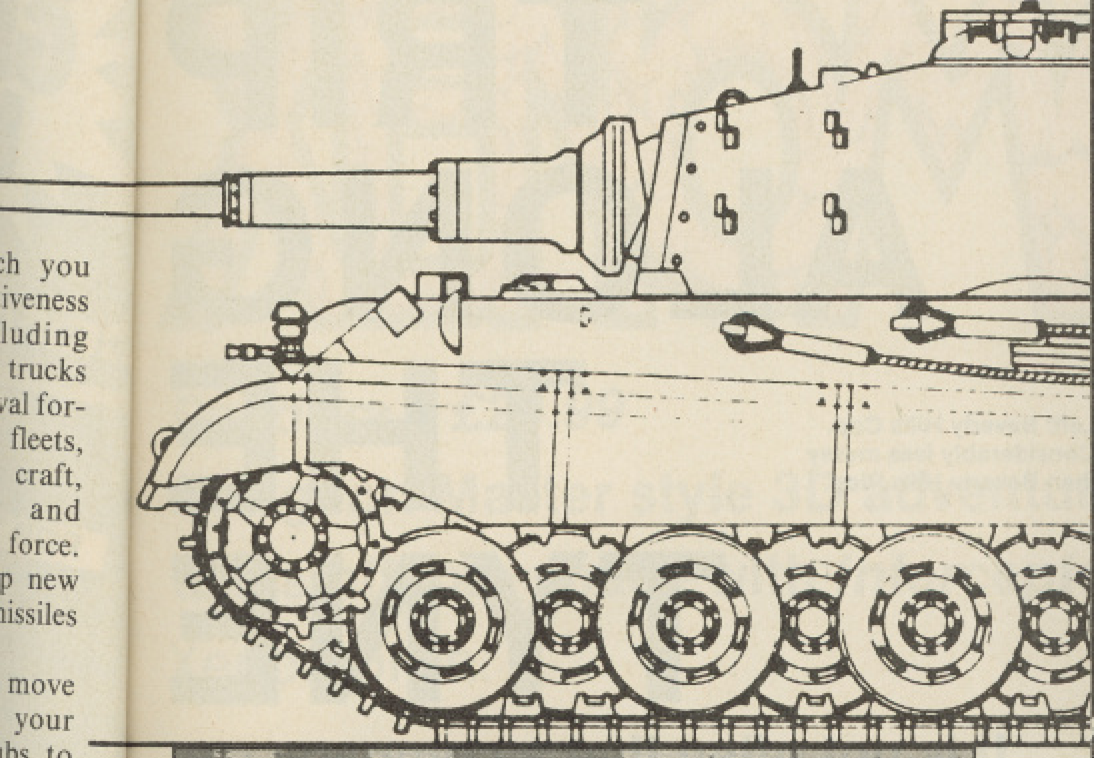
move
your
nbs to
aunch
n, try
nemy

rm

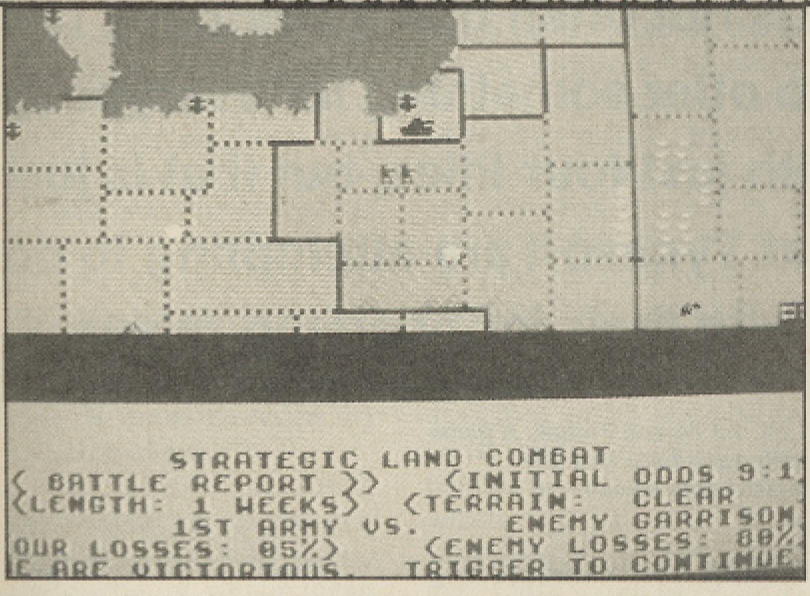
your
with
omb
or

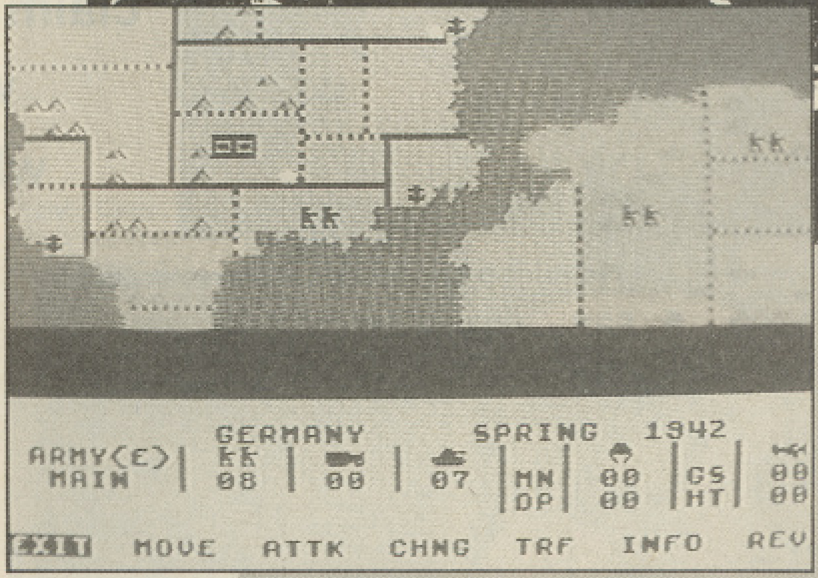
ains
uria-
eate
not
egic
ight
now
to
the
ted
any

to
acy
ich
an
ex
le,
py
ry
ed
as
or
to

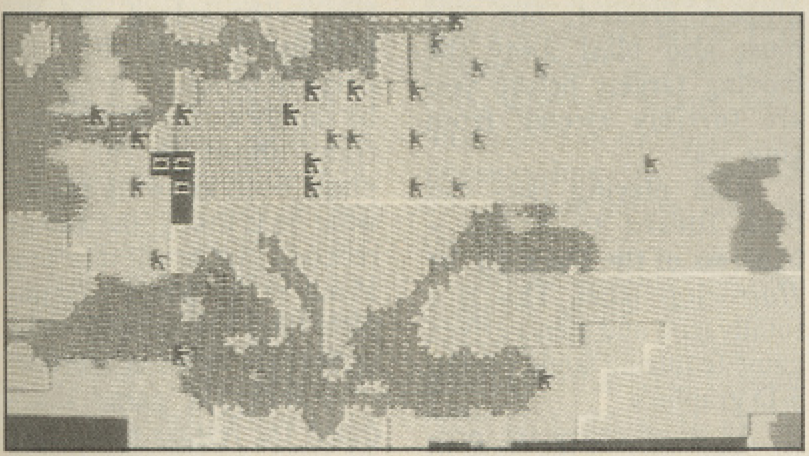




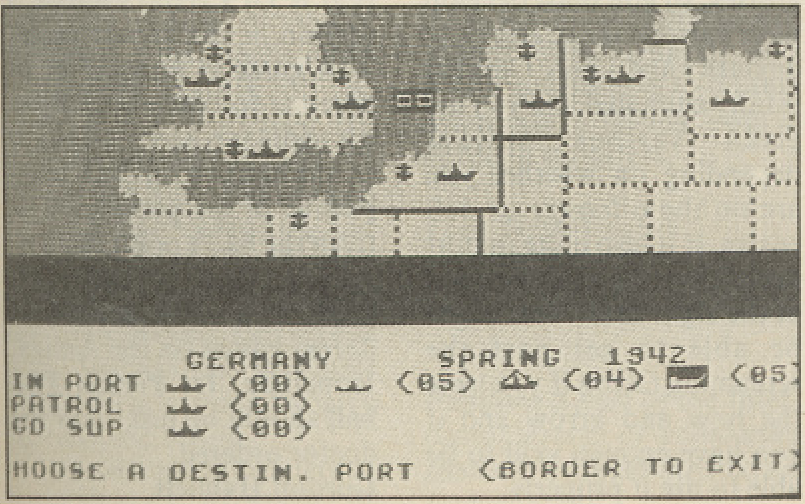




Above left: And so they came across the hills, bearing banners, slogans, and crude weapons. Their breath stank, and their foul language resounded through the valleys. It was the coming of the England supporters. It was War.



Left: Let's take that small island over there. "England" you say.



Left: The troops are under fire, which is better than being on fire!

INFO

Gameplay: 95%
Graphics: 65%
Sonics: N/A
Lastibility: 95%
Overall:

85%

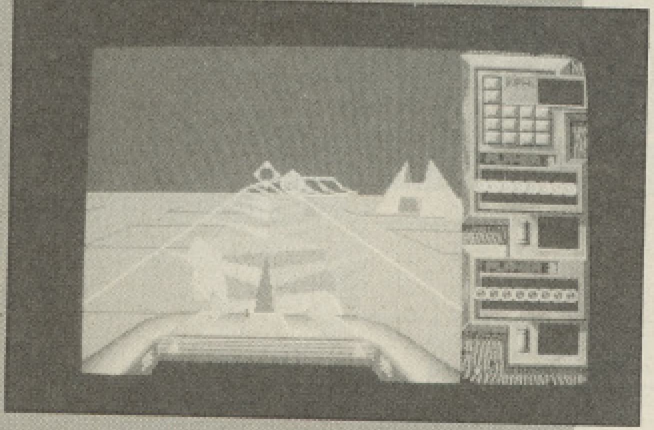
SSI specialises in computer wargames and roleplaying games, including the AD&D range.

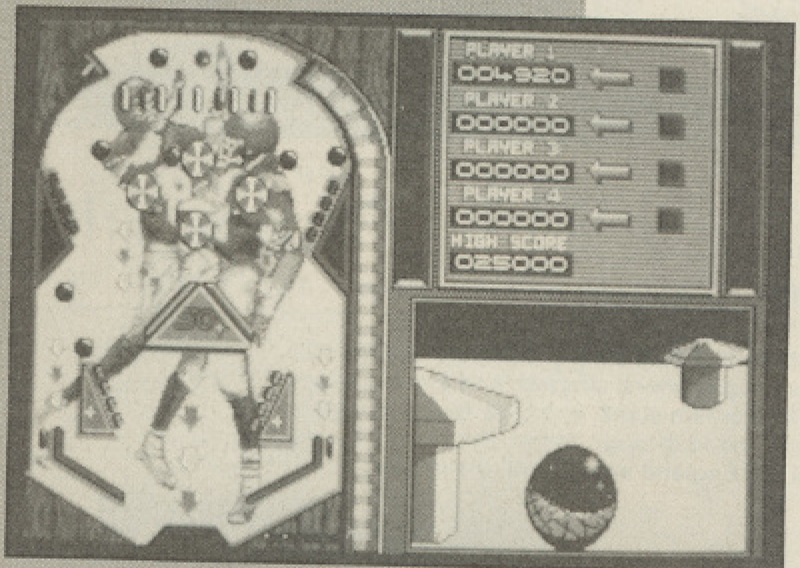
TRIP ALONG THE TYNE

It is not often that a company can claim to offer something for everybody with just four titles, but that is just what Tynesoft are attempting to do with their forthcoming releases.



Left: Beverly Hills Cop. Considerably less messy than Beverly Hills Plop.





Left: 1st Person Pinball. A game with more balls than the Amsterdam Museum of Sex.

Their biggest title and one which is hopefully going to be out in time for Christmas is **Beverly Hills Cop**, based on the Eddie Murphy film.

The game is split into five different sections. Before Axel can start to solve the crime, he must first follow his colleague to the arms factory where the robbery is taking place. If he gets through the early morning traffic in one piece, he then has to dispose of the gang members as best he can. Naturally he can't use his gun with so much explosives lying around.

A high speed car chase ensues as you try to find the mansion where the trucks are heading. This is the headquarters of Mr. Big and you have to find a route through the maze of hedges in his garden before forcing your way into the house and the final encounter. All you have to do then is get out...

Roller Coaster Rumbler is a shoot-em-up with a difference. Not only do you get a high speed trip round one of the meanest big dippers around, but you must also blast away the moving targets before you are forcibly ejected from your seat.

Role playing fans can look forard to **Elvira – Mistress of the Dark** on the *Horrorsoft* label. This is a totally icon and menu driven game featuring some superb 3-D graphics.

As your character progresses, so you must develop your various skills; strength, dexterity and so on. Combat is fully animated and you are given various options depending on whether you are on the offensive or defensive. It is also quite important to use the right weapon at the right time. You might be able to get past the screaming falcon if you have the bow and arrow and if you have enough skill to be able to use it properly.

There are plenty of puzzles to be solved and the promise is that they are going to be tough. It will not be simply a case of using the right object in the right place. Even knowing exactly what he is doing, the author reckons that it will take him about seven hours to complete the game so what hope is there for us lesser mortals.

Finally, a game scheduled for release early next year is **1st Person Pinball**, a version of the arcade game. This game is unusual in so much as you can switch from the usual top down 2-D view of the table to a 3-D perspective of the game as seen from the ball's point of view. As a dedicated pinball freak, there is a serious lack of decent games on the Amiga. Hopefully, **1st Person Pinball** should be just what the doctor ordered.

Gordon Hamlett

XENOMORPH

Pandora – £24.99

Dungeon Master style 3D adventuring takes off into space with *Interceptor's*

Xenomorph.

It was supposed to be a routine supply mission to Cygnus 61 when suddently, everything went very wrong. Firstly, you managed to crash your ship on landing and now have to find materials to get it fixed and secondly, the colonists seem to have disappeared which isn't all that surprising as the base is now overrun by mutating aliens.

The base in question is represented on screen as a series of scrolling 3D rooms and corridors which forms the main part of the screen display. Around this are five smaller displays that include movement icons, what you are holding in each hand, your backpack and a personal display showing your current state of health and a picture of you that you can customise using the programs DNA machine so that your on screen persona can match yourself, a hero or favourite *Your Commodore* reviewer. One particularly impressive feature of the game is that when you are getting something out of your backpack that screen fills the main screen area and the player status screen becomes a mini version of the 3D view that still scrolls and displays all monsters and objects so you can carry on with the action.

Apart from the variety of background displays of which the enclosed air ducts are my favourite, the range of weapons featuring laser rifles, stun pistols, grenades and alien seeking robomines and the objects such as a proximity detector that you can find, the main appeal of the game is its range of aliens and the way they change and mutate. One example is best described in its adult form as an insectoid lobster but begins as a harmless egg which can be easily fried with a single blast of a laser gun. Once it hatches it turns into a worm like larvae that scurries away to hide from you, where it wraps itself into a cocoon and metamorphosises into the insectoid lobster that comes looking for you.

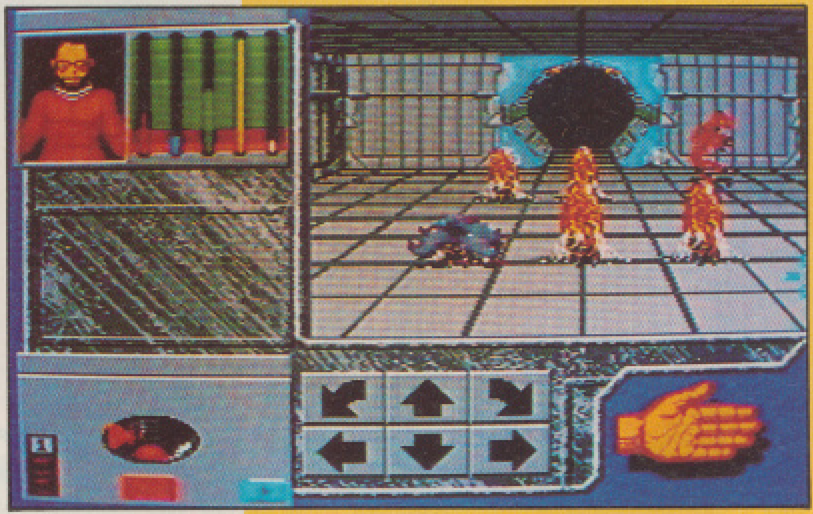
Not all creatures are that complex as the game also features a rather unpleasant green blob that when blasted turns into two green blobs! In this game you have to learn which weapons to use against which creature and it isn't always easy to do this when you're fleeing from a horde of monsters.

Tony Hetherington

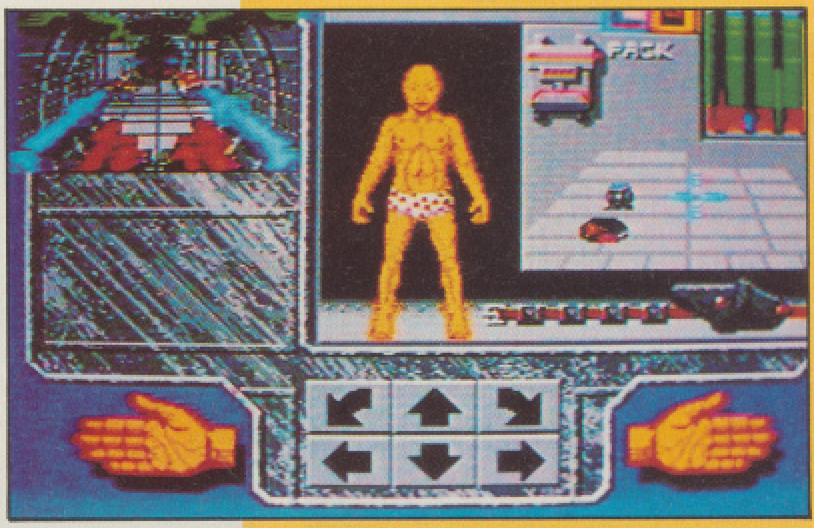
***Pandora** is part of the* Interceptor *group of companies that aslo includes the* Players *budget range.*



Right: "Okay, who's sneezed on the ceiling?"



Above: Give the guy a hand.



Above: He must've gone to a second hand shop!


YOUR
COMMODORE



YOUR PROGRAMMER

CONTENTS

How to use the pull-out...

Remove from magazine and cut spine. Punch holes on edge and insert in a ring binder for easy storage and long-term protection. Alternatively you could feed them to the dog, but I favour the former.

MACRO ASSEMBLER

Be the master of your machine code program with this extensive 3 pass macro assembler

By I. Goffe

Many assembler packages have been available for the Commodore 64 since the arrival of the machine, but sadly many such pieces of software are scarce in the shop today. I have noticed a steady revival of assemblers, thanks largely to magazine such as this, it is especially true of the 6510+ assembler in the May/June issue of its sister magazine *Commodore Disk User*, which offers many more facilities than its commercial counterparts. My Macro assembler is intended to be yet another valuable tool to the machine code programmer, with the added bonus of macro, and conditional assembly; this allows much more structure to be implemented into your own machine code programs.

Presented here is a sophisticated 3-pass 6502/6510 Macro Assembler that supports many advanced features, including:

Full macro assembly with parameter passing;
Linkable source files;
Including directly from disk;
Symbol table/buffer space memory configure;
Conditional assembly (IF, THEN, ELSE);
Symbol table cross-referencing;
Selective assembly output;
Full DOS support;
Extendable capabilities.

The assembler can be configured to work with either disk, or cassette filing.

The Assembler - Getting Started

The assembler code runs from $6E00-$A000. To initialise the assembler from a cold start type: SYS 28160, this redirects the RESTORE key to allow you to enter the assembler command mode with a single stroke key press. If you should change the RESTORE key vector use SYS 28160, which will re-initialise once more. The use of a cold start also clears the current symbol, macro directory, and macro library areas.

Once a cold start has been issued as above, the program title will be displayed, at this point as Basic wedge was to be used to enter the assembler command mode, but I wanted the system to be able to run alongside an extended Basic if there are no memory conflicts. I opted for the idea of being able to call up the main assembler command mode by pressing a single key which emulate the Basic command 'SYS 28215' which calls up the assembler command mode via a warm start.

To summarise, pressing RESTORE whilst in the basic editor will automatically do the Basic command 'SYS 28215' to jump into the assembler via a warm start.

Extra Note on Compatability with Action Replay

Some ROM routines which are called inside the assembler seem to corrupt when the assembler is first run, to get around this problem follows these steps...

1. Type SYS 64738 to jump into a normal reset
2. Press the reset button on the back of the cartridge to exit back to the 'FASTLOAD' interpreter which will allow the assembler to operate. In this case all FASTLOAD/Warp loading can be used in conjunction with the assembler, making source file I/O extremely fast and effective.

The RESTORE key does not work correctly with 'FASTLOAD' installed, so a manual 'SYS 28125' needed to be typed to jump into the assembler command mode.

Entering Source Files

The source files are maintained in the standard Basic editor, so you will not need the assembler present for actually entering the source. As in Basic only lines 0-63999 are valid.

The source must follow a set format, however, true field-tabulation is not required for LABEL, OPCODE, OPERAND but some form of correct syntax needs to be followed. In general the syntax would be one of:

```
LABEL OPCODE OPERAND;
LABEL !
OPCODE;
OPCODE OPERAND.
```

Note that if a label is not followed by an opcode then a comment (!) is expected. A comment can be used in any available field. A space is needed in between the 'fields', and where applicable quotes must be set out in the text correctly.

eg):
10 LDA 10 ! space between LDA and 10
20 LABEL ! a comment is needed if no following opcode
30 DINCLUDE "name" ! opening and closing quotes needed.

When an opcode of the form ROL A, ASL A is encountered it should be entered with no space as ROLA to avoid the confusion between:

ROLA (Rotate left accumulator)
and
ROL ALABEL (Label beginning with 'A')

Pseudo-Opcodes (Assembler Directives)

Pseudo-opcodes can be used in the assembler to enable you to direct or command the assembler to carry out various functions at assembly time only.

A complete summary of pseudo-codes follows with their syntax, and use.

PSEUDO-CODE summary

(Take x = valid expression)

DIRECTIVE	USE
BYT x, x1, x2...	Stores x and the following 8-bit numbers in memory, any valid expression is allowed, along with a string of characters if they are given in quotes eg) BYT $C0, $fE04, "text", %00001001
DINCLUDE "filename"	Includes a source file directly from disk, using up no available memory
ELSE	Toggles the conditional flag, on a new assembly the condition is set to true – assembly turned on.
ENDIF	Turns off any condition to continue assembly as normal
IF x	Sets condition true if x is non-zero, if x is zero then subsequent assembly will be turned off until another conditional statement proves otherwise
LOAD x	Stores object code at address x, but takes references for absolute values from the origin (*)
LINK "filename"	Links next source file to continue assembly – see the section on this function
OUT x	Sends assembly – text output to device x, default is 0 (no output), 3 = screen, 4 = serial printer
RELINK "filename"	Used to cycle to the first file in linked assembly for the next pass. ie) the last file in linked assembly should end with RELINK "name", where name is the first file in the linking
RUN x	Sets the execution address to x – the address that the editors' 'G' command will jump to
RES x	Reserves x bytes of memory, in essence it adds x bytes to the program counter, and is used to define storage space
SYM "filename"	Appends a previously saved symbol table into the current symbol table being produced by the source file. This allows symbol cross-referencing between files. Note that the symbol table limit is not checked for as a complete-block-load is used for speed, so be careful when using this option. Any labels previously defined before a symbol table is loaded are not checked for re-defined errors, in this case the first reference in the table is used. Any subsequent re-defined errors are issued when defining labels outside of this directive.
TXT "string of text"	Stores a single string of ASCII characters in memory
WOR x1, x2, x3...	Stores x in memory as a 16 bit number in lo/hi byte form

Note that the origin of the object code is defined by the * symbol, eg) 10 *=$C000 will define the origin as 49152 decimal. More than one origin can be stated in the source, but only the last one can be used in the direct object save command in the editor.

The 3 Passes

A three pass assembler has been incorporated in order for the assembler to be more versatile, this is especially true in the case of forward referencing, eg) in equate lines. To show this a small source file to pass values from label to label is shown. *Supersoft's* MIKRO ASSEMBLER, and the 6510+ assembler cannot handle the following example totally correct, but this macro assembler can – try it for yourself!

```
            OUT 3 ! no operand in the
              6510+ assembler *=$C000
C000 A50C              LDA LABEL1
C002 EA        LABEL 3 NOP
C003 EA                NOP
C004 A50C              LDA LABEL1
               LABEL2=10+LABEL3
               LABEL1=LABEL2-49152
```

As it can be seen LABEL1 is $0C and the object code created gives this result, but try it on the other 3 pass assemblers mentioned above!

The Editor command Mode and Set

When the assembler is entered via warm start by either pressing RESTORE after a cold start, or a direct command of SYS 28215, you will be presented with a prompt (>) – this is the editor command mode, and is where you type in the editor commands listed in the table below. These allow you to operate various features of the assembler eg) assembling and maintaining source files. A complete summary of the editor commands available, and general syntax follows. Each command is called up by entering a single stroke command letter. Any arguments used in the commands are separated from the command letter by a single space. Each argument thereafter is separated by a comma.

Editor Commands Summary

A
SYNTAX/ARGUMENTS n/a

Will assemble the source file in memory. During assembly pressing RUN/STOP will abort to the command level. Upon aborting the line at which assembly was aborted will be displayed, and if applicable the file which it was reading at the time, this is also true for any error reports during assembly time.

If any files are read into the assembler during assembly including, and reading, macro definitions then the disk status will be displayed to signify that data is being read in from disk instead of memory.

This is shown on screen by two sprites in the shape of disks, the left-most one will change colour only on the reading of a new file, so if more than one file is to be included in the source for example, then the first file

"filename"

will show as a white sprite (colour 1), the second file when being read will show as a red sprite, etc, this is the same on all passes as the colours are automatically reset.

The right-most disk-sprite will flash to show that data is being read in externally.

B
SYNTAX/ARGUMENTS n/a

This command exits back to Basic, or from the return destination if another program calls the assembler

D
SYNTAX/ARGUMENTS n/a

Causes a listing to screen of the disk directory, without corrupting the basic program, as is the case of the LOAD "$",8 command from Basic.

E
SYNTAX/ARGUMENTS Any valid expression

Following this command you can evaluate any expression that can be used inside the assembler, this includes all the valid operators, and pre-defined symbols from the current symbol table.

F
SYNTAX/ARGUMENTS string to find (no quotes needed)

Finds any occurence of the given string in the current edited source file. The strings that are found will be shown by their relevant line numbers. Pressing RUN/STOP at any time aborts from this mode.

G
SYNTAX/ARGUMENTS Pre-defined RUN value from source

Goes to the address specified by the RUN directive. A new assembly resets to a no-run mode, only a new RUN value which is given whilst assembly takes place will allow this command to operate.

H
SYNTAX/ARGUMENTS n/a

This command displays a summary of this set of command-letters.

I
SYNTAX,ARGUMENTS "filename"

Saves the last object code with start, and end addresses taken from the origin (*) – this only applies to the last origin used, if there has been more than one value given as: *=value.

J
SYNTAX/ARGUMENTS "filename"

As the I command, but saves from the addresses taken from the LOAD directive.

L
SYNTAX/ARGUMENTS line number (no value = start of file)

Lists to screen the current source file, from the line specified.

M
SYNTAX/ARGUMENTS n/a

Lists the present macro library. Once this command is issued a directory of the macro-definitions currently in the macro library is given one filename at a time.

After each name is displayed the keyboard is polled for a key press, pressing 'L' at this point lists out the macro in its expanded form, whilst any other key brings up the next file in the macro directory. When all of the macro directory has been displayed the number of spare bytes in the macro library is given, note that such space wasters as comment lines are deleted in order to compect the data given to the macro library as much as possible.

N
SYNTAX/ARGUMENTS

Appends a source file, once loaded the file is automatically renumbered.

O
SYNTAX/ARGUMENTS n/a

OLD – brings back a previously NEW'd program, or one erased after a reset

Q
SYNTAX/ARGUMENTS "filename"

Saves out a copy of the current symbol table for use with the SYM directive to cross-reference between files. It is also useful if a debugger was to be written for the system to take advantage of symbolic output.

R
SYNTAX/ARGUMENTS start line, step

Renumbers a file with the given start, and line step values

S
SYNTAX/ARGUMENTS "filename"

Lists a source file directly from disk to the screen, no memory is used, and therefore the current source file is not over-written.

U
SYNTAX/ARGUMENTS start line, step

Jumps into Basic, with an auto-line numbering entry enabled. The start line, and step are given, and after each press of RETURN the next line for editing is displayed, entering a null-line exits from the AUTO mode. Jumping back via a warm start will bring you back to the command mode.

X
SYNTAX/ARGUMENTS n/a

Saves a block of memory, enter with no parameters, as you will be prompted for the address range and filename. Note this routine ignores any checks on undefined labels if used.

Y
SYNTAX/ARGUMENTS n/a

This command lists the current symbol table, with values given as hexadecimal values. Pressing RUN/STOP will abort.

to send this output to a different device other than the screen use the added configure program.

Z
SYNTAX/ARGUMENTS n/a

All the features of the 1541 DOS have been incorporated into the assembler. Once in this mode you will see the prompt 'DOS' to let you know that you are in DOS support mode. Following this is the usual prompt, typing any normal DOS command in at this sgage eg. NEW0: ANYDISK, 64 to format a disk would be accepted, the error channel is automatically displayed after any command. If RETURN is pressed the error channel will be displayed and updated, pressing 'X' will exit back to the main editor.

Labels

A label or symbol in the macro assembler can be of 2 forms, firstly it can be defined as a constant by using the '=' symbol:

```
10 RESET = 64738 ! 16 bit constant
20 ZEROPAGE = 10 ! 8 bit constant
```

It can also refer to a location in the source file to be jumped to or operated upon in some way:

```
10 LABEL ! location within the source file
20 BEQ PANEL ! branch to it
30 COUNT BYT 0 ! holds an 8 bit number
40 COUNTHI WOR 0 ! define as word (16 bit)
50 LDA COUNTHI ! lo byte of COUNTHI
```

Labels which have not correctly been given a value will be suffixed with an "*" in the symbol table.

Storing Object Code

The directive LOAD is extremely useful when the address that you want to store your code at is inaccessible with the assembler present. For example if you wish to run a routine from the default screen address (1024), any data that is POKEd to it would of course be over-written by on-screen messages before you have time to save it. You would therefore store it at a suitable area of RAM, eg). LOAD $C000, but give the origin address as *=1024, you could then signify a relocatable load address of 1024.

Note that the LOAD directive is needed AFTER the * is set, if the * is given after a LOAD then the origin will over-ride the LOAD, and store data from the base of the origin.

```
eg). * = $2000 ! Labels and jumps will take values from here
LOAD $C000 ! but code will be stored from $C000 onwards
```
(Note the above order)

When assembly has been successfuly completed the object code start and end addresses will be displayed, and if a LOAD directive has been used, then the storage address will also be shown. The execution address will also be displayed if RUN command has been used.

In the following text the 'TOP LEVEL SOURCE' file relates to the file actually in the Basic editors memory.

Using DINCLUDE and DEFINE

If including (DINCLUDE) or reading in a macro definition (£) you must use the command within the TOP LEVEL SOURCE file, therefore all included files must not try to include a file from inside itself. Similarly, they should not try to define a macro definition (£), ie. DINCLUDE and £MACRO-NAME directives cannot be used in a file that already been included with the DINCLUDE directive itself.

If an attempt is made to do the above, then a 'NESTED' error will be issued. The errors are 'NESTED INCLUDE' when an include uses a 'DINCLUDE' directive, and 'NESTED INCLUDE/MACRO' when a macro definition is used within an included file.

Extending/Larger Source Files

At sometime during writing source files you will appear to have used up all available source file memory. To get around this, two pseudo-opcodes have been used to chain or link more than one file together for continuous asembly.

LINK "filename" is used to chain the next file for assembly, while symbols are still retained from the previous file **RELINK** "filename" is used to restart from the first file in the link for the next pass, there is no limit on the number of files linked, only on the symbol table space that is used up, and the 'physical' address being poked to.

LINKing reads the whole file into the editor workspace completely overwriting the previously edited file. The only advantage over including directly from disk is that files can be read into the workspace much faster.

It also allows some form of compatability with the LNK command found on Supersoft's MIKRO assembler.

A more powerful command is the DINCLUDE directive which allows direct including from disk. It is another way of assembling an expanded source file by allowing more than one file to be assembled as in the LINK command. But it has the added advantage of not overwriting the source file currently in memory, this allows you to store you object code in more available memory which the included source file would have been occupying if it were read into the editors workspace as a complete edited file.

Using Macros

MACRO DEFINITIONS

A MACRO DEFINITION is stored as a single source file on disk, and each is loaded in separately to make up the MACRO LIBRARY. A MACRO LIBRARY is used to give details of what the current macro library holds.

Macro definitions consists of any portion of a source file that you only have to write once – as a macro definition – and a 'call' to that macro will expand it to a totally relocatable part of the main source file.

Therefore if you need to keep using the inst;ructions CLC, LDX #$10, LDY#$10, JSR $FFF0 to set the cursor coordinates to (10,10) it is

rather time consuming, and a waste of source file space to keep keying in the same code. Instead you could define it as a macro definition called CENTRE – to achieve this type the commands as you would a normal source file, and save the file with SAVE "CENTRE",8.

Each time you wish to use the given instructions instead of typing out the same code you can 'call up' or 'invoke' the macro 'CENTRE' and the instructions LDX#$10, LDY#$10, JSR $FFF0 will be generated into your source file. See the section on how to invoke the macro files, and add them to the macro library.

Added Macro Features

A couple of features are included to make the macro definitions more meaningful. The first feature is to allow true parameter passing upon invoking a macro.

parameter Passing in a Macro Definition

The macro definitions can accept parameters by using the '/' character to preceed a parameter number between 0 and 9.

eg) LDA #/0
STA/1

in the macro definition would change /0 into the text passed by parameter 0, and /1 with parameter 1.

See the section on macro invokation for more details of how to pass parameters within macros.

Localised Symbols

All labels within a macro definition will be read in as a local symbol, this is achieved by adding a unique 2-digit code to the symbol within the definition. e.g. the symbol LABEL1 within a macro definition will be given as ABLABEL1 on the first 'call' to the macro, ACLABEL1 the next time, etc, this is so that the symbol LABEL1 is not redefined everytime a macro is invoked, and also direct references can be given to labels within individual macros.

Every reference within the macro definition to a label automatically refers to one within a particular macro (a local reference). If you wish to refer to a label outside of the current macro definition you must signify that it is a global reference – this is achieved by prefixing the label with a full stop.

The following is the source inside a macro definition:

BEQ LOOP ! refers to the label 'LOOP' inside the current macro definition.

JMP .MAIN ! refers to the label 'MAIN' outside of the current macro definition.

Adding a Macro Definition to the Macro Library

In order to invoke any macro it must first be stored within the macro library. A previously saved macro definition can be added to the library by prefixing the macro name with a £ symbol:

```
10 £MACRONAME
```

Note that there is no space between £ and the filename. The macro definition must be given to the macro library BEFORE it is invoked.

Listing the Files in the Macro Library

To summarise what macro definitions are present in the macro library you can view the macro directory with the use of the library you can view the macro directory with the use of the editors 'M' command.

Invoking Macros

This is the term used to expand the macro definitions into the source file. Once a macro definition has been stored in the macro library it can be invoked in the source file by using the @ symbol to preceed the macro filename to be invoked.

```
10 £machroname ! adds the macro to the macro library
20 macroname ! invokes (expands) the macro
```

Parameter Passing During Macro Invocation

The macros to be expanded can be called up with parameters as disucussed in the section on macro definitions.

To invoke the following macro definition:

```
10 LDA#/10
20 STA/1
```

Save it to disk with SAVE "POKE.MAC",8

The above example is to define a rather simple POKE x,y type of macro definition but servies its purpose. Once it is saved type NEW to clear the current source file and type in the following:

```
10 *$C000 ! sets origin
20 £POKE.MAC ! gives definition to macro library
30    POKE.MAC 5,53280 ! pass the poke value, address
40 RTS
```

It can be seen that parameter 0 is 5 (the source will now contain LDA 5), and parameter 1 is 53280 (source contains STA 53280)

A parameter can take any form whatsoever, opcodes; varius operands, or any valid expression. Each parameter is separated by a comma – wso if you are passing text, as in "HELLO, MY NAME IS" the comma would tell the assembler that it is the end of that parameter so be careful!

The number of parameters allocated to a parficular macri os 10 (0-9), however more than this is allowed if ASCII codes which follow "0"-"9" are given, but 0-9 should be used as standard. Because all labels within a macro definition are operated on as localised, any parameter passed to it will need to prefixed with a full stop if they refer to a global label outside of the definition.

Example of a Top Level Source File

```
10 RED = 2 ! global label outside of a macro definition
20    COLOUR .RED ! prefix with a '.' as we are using the global label RED within the macro definition.
```

You will be told if you try to invoke a macro that is not present in the macro library. If a parameter is required by a macro definition and one isn't given on invoking it, a 'PARAMETER MISSING' error will be issued. This is because no comma will be looked for (as it is param.0) and data that was expected to be in the buffer will be used. The above is of course a rarity, but worthwhile to mention. Any parameter given to a particular macro definition will only be verified once it has been expanded into the source file.

Where to Invoke Macros

You cannot 'nest' a macro, ie. call a macro from within a macro definition – if you do a 'NESTED MACRO CALL' error will be given. It is possible to invoke a macro definition from within an included file. If an error occurs when invoking a macro, the line of the invocation will be shown. But the text given will be from the offending syntax from within the macro file. At this point a comment symbol will appear preceeding the text, it is not a "bug", but the way in which the assembler handles the data from inside a macro. I just thought that I'd mention it!

Error Messages and Reports

There is a comprehensive set of error messages which are detailed below. In each case they are used when a direct command is issued, or when an error is found during assembly, in this case the offending line number is shown together with the file in which it occured. The error messages comprise of an error number, along with a summary of the error.

00 INVALID COMMAND – An invalid command has been typed in at the command level. Use the 'H' command to see a summary of the editor commands available.

01 INVALID HEX DIGIT – A digit has been used after the '$' which is not in the range O-F, or the correct number of hex digits has not been used.

03 NO OPCODE PRESENT – A line is found to have no opcode or directive to work with.

03 LABEL REDEFINED – A label has been defined more than once in the same source file.

04 ILLEGAL ADDRESSING MODE – There has been an attempt to use a 6510 instruction that is in the incorrect context. Eg. LDA ($0C), X will produce this error.

05 NOT ZERO PAGE – A 16 bit number has been used where an 8-bit expression was expected, for example in immediate addressing mode, or in the BYT directive.

06 LABEL UNDEFINED – There is found to be a reference to a label that you have not defined.

07 INVALID INDEX – An index letter othat then X or Y has been used. LDA $FB,Z will produce this error.

08 BRANCH TOO FAR – A relative branc has been used which exceeds the relative (-128/+127) byte limit.

09 UNDEFINED MACRO CALL – The macroname is trying to invoke a macro that has not been defined using the £ syntax.

10 MACRO PARAMETER MISSING – A pre-defined macro definition is expecting a parameter to be passed to it when invoking it.

11 FILENAME NOT FOUND/ I/O ERROR – This is the general failure of a command which reads data from a storage device. If the file is not found you will be told, and when you have inserted the correct disk any key will allow the load operation to continue. Pressing RUN/STOP will abort, and give the above error message. This allows for extremely large linked or included files to be chained – as they don't have to be present on the same disk, so you are not limited by the disk space.

12 INVALID BINARY NUMBER – A number following the '%' prefix does not contain a full set of 8 1's or 0's, or if other characters which are not '0' or '1' are used.

13 DEVICE OFF LINE – The OUT directive has selected a device for output that is not connected to the computer, or is not switched on.

14 NESTED MACRO CALL – A macro that is being called or invoked is trying to invoke a macro.

15 NESTED INCLUDE FILE – An included file is trying to use a DIN-INCLUDE directive within itself.

16 NESTED INCLUDE/MACRO – An included file is trying to define a macro withn itself ie. £name command inside an included file.

17 EXPRESSION OVERFLOW – An expression is found to be over the 16-bit range ie. (0 or) 65535.

18 SYMBOL TABLE FULL – The symbol table limit has been reached – the configure program allows the start and limit addresses to be changed as required.

19 MACRO DIRECTORY FULL – As above, but refers to the macro directory.

20 MACRO LIBRARY FULL – As above but for the macro library.

The above example shows the conditional statements in action. It gives A = 0 if flag = true, A = 1 if flag is false.

The instructions STA 53280 and RTS will be assembled whatever the previous conditions permitted. If assembly is turned off any further conditional statements must be on a separate line from a label.

Take the following to be when the condition is currently in no-assembly mode.

LABEL ENDIF ! will skip this line as LABEL is not to be defined, but the single line of ENDIF will work fine: ie)
ENDIF ! alone is required.

On any new usage of the editors 'A' command the conditional flag is automatically set to true – assembly on.

Syntax of Expressions

When hexadecimal numbers are used they must follow either $xx or $xxxx where x is a valid hexadecimal digit. Any other combination of hex digits will fail any checks. Only 8 bit binary is allowed but all 8 bits must be specified after the '%'.

Additional Notes

Note that the assembler is set up for disk usage from device 8. Using disk as the medium allows the macro/include/SYM cmds to function. These features of the assembler cannot be used with cassette. The remainder of the assemblers functions remain intact for cassette users. Disk commands : list from disk/directory are of course disk specific.

Editor commands which use filenames can be used with or without the quotes eg. S "name" will be read the same as S name. However pseudo-opcodes in the source file which use filenames must be given with the open quote, but you may skip the closing quote.

More than one error may be found on a line, but may be related eg. BNE ALAB – will give "BRANCH TOO FAR" and also "LABEL UNDEFINED" if ALAB is not present, as it is trying to branch to an unknown destination.

Getting it all in

Four Basic loaders are used to POKE in the main assembler code. These are named BLOCK 1 – BLOCK 4. RUN each of these programs in order, and when the message BLOCK 4 OK is displayed enter as direct commands:

POKE 43,0: POKE 44,110: POKE 45,0: POKE 46,160: SAVE "MACRO ASSEMBLER",8 (Cassette users read ,8 as ,1).

Now reset, and load the assembler code back with LOAD "MACRO ASSEMBLER",8,1 (cassette = ,1,1).

When READY. appears type NEW followed by SYS 28160 to initialise the assembler with a cold start.

The configure program can be typed in and saved as usual with SAVE "CONFIG",8. This must have the main assembler code present before RUNning.

A Simple Trace of the Link Directive

Take file below to be called "MAIN"

```
10 ! MAIN TOP LEVEL SOURCE
30 ! a few instructions
50 lda $dd0d
60 and # $fe
70 sta $dd0d
80 !
90 LINK "SOURCE2" ! link next file
```

```
10 ! This is the file called "SOURCE2"
20 NOP
30 NOP ! do nothing really
40 LDA BASICAD
50 LINK "SOURCE3" ! link next file
```

```
10! This is "SOURCE3"
20 BASICAD=43 ! give the label for
   the above files
30 RELINK "MAIN" ! loop back to
   the main file
```

When linking from cassette, you will be told to insert a file and press a key, this is due to the need of rewinding etc. Linking from disk is automatic.

As stated the TOP LEVEL SOURCE file is the only file in which a DINCLUDE directive can be used. Its function is best used to set up a type of batch file, a small file which 'calls' the main bulk of the source, a typical batch file could be:

```
10 ! TOP LEVEL SOURCE FILE
20 OUT 3 ! sends output to screen
30 SYM "KERNAL.SYM" ! reads
   symbols for the KERNAL routines
40 £OPEN.MAC ! define a macro
   called "OPEN.MAC"
50 DINCLUDE "MAIN1" ! includes
   the main code part 1
60 DINCLUDE "MAIN2" ! includes
   the main code part 2
```

```
PROGRAM:BLOCK1

97  10 REM CBM64 MACRO ASSEMBLER
     BASIC LOADER BY IAN GOFFE 1
    989 BLOCK 1 (28160-31359)
52  20 PRINT"[CLR]":LI=100:FORA=
    28160TO31359STEP16
D7  30 C=0:FORE=ATOA+15:READL:C=
    C+L:POKEE,L:POKE53280,L
80  40 NEXTE:PRINT"[HOME]"LI
4F  50 READC1:IFC<>C1THENPRINT"E
    RROR IN LINE:"LI:END
D4  60 LI=LI+10:NEXTA
AF  70 PRINT"BLOCK 1 OK...":END
6F  100 DATA 32,85,159,160,0,173
    ,117,155,133,63,173,118,155,
    133,64,169,1889
D9  110 DATA 255,145,63,200,169,
    255,145,63,173,67,131,133,63
    ,173,68,131,2234
74  120 DATA 133,64,160,0,169,25
    5,145,63,173,71,131,133,63,1
    73,72,131,1936
65  130 DATA 133,64,169,255,145,
    63,96,169,255,133,204,32,68,
    229,169,71,2255
8E  140 DATA 160,111,32,52,131,1
    69,6,141,32,208,141,33,208,7
    6,67,157,1724
88  150 DATA 169,7,133,1,169,13,
    141,248,7,141,249,7,173,19,1
    31,240,1848
B4  160 DATA 3,32,41,147,32,171,
    145,32,27,147,32,231,255,32,
    204,255,1786
4E  170 DATA 169,13,162,0,134,19
    8,142,42,129,142,170,145,142
    ,72,147,142,1949
AF  180 DATA 19,131,142,255,148,
    157,151,159,232,224,40,208,2
    48,162,0,32,2308
54  190 DATA 169,110,32,236,110,
    240,251,201,20,240,51,32,182
    ,145,157,151,2327
16  200 DATA 159,201,13,240,15,2
    32,76,146,110,169,13,32,182,
    145,169,62,1964
52  210 DATA 32,182,145,96,162,0
    ,189,252,112,240,9,205,151,1
    59,240,25,2199
2C  220 DATA 232,76,182,110,169,
    209,160,111,32,52,131,76,80,
    110,224,0,1954
27  230 DATA 240,192,202,32,182,
    145,76,146,110,138,24,42,170
    ,189,34,113,2035
7E  240 DATA 141,242,112,189,35,
    113,141,243,112,108,242,112,
    138,72,32,228,2260
03  250 DATA 255,141,78,112,104,
    170,173,78,112,96,32,148,123
    ,169,2,141,1934
AC  260 DATA 130,155,32,29,128,1
    73,42,129,240,3,76,80,110,17
    3,21,128,1649
44  270 DATA 133,20,173,22,128,1
    33,21,32,19,166,166,95,164,9
    6,134,253,1755
BB  280 DATA 142,153,132,132,254
    ,140,154,132,169,1,141,171,1
    41,32,1,141,2036
81  290 DATA 165,197,201,63,208,
    5,169,1,141,79,112,173,79,11
    2,240,3,1948
9C  300 DATA 76,80,110,76,45,111
    ,96,155,54,53,49,48,47,48,50
    ,32,1130
0C  310 DATA 77,65,67,82,79,32,6
    5,83,83,69,77,66,76,69,82,32
    ,1104
D1  320 DATA 40,67,41,32,49,57,5
    6,57,32,73,46,71,79,70,70,69
    ,909
5F  330 DATA 50,54,49,49,49,32,8
    3,79,85,82,67,69,32,66,89,84
    ,1019
B6  340 DATA 69,83,32,70,82,69,6
    9,46,13,0,255,17,54,53,49,48
    ,1009
38  350 DATA 47,54,53,48,50,32,7
    7,65,67,82,79,32,65,83,83,69
    ,986
EC  360 DATA 77,66,76,69,82,32,4
    5,32,86,49,46,52,32,49,47,49
    ,889
A3  370 DATA 57,56,57,13,17,42,4
    2,32,80,65,83,83,32,49,32,42
    ,782
C3  380 DATA 42,0,13,17,42,42,32
    ,80,65,83,83,32,50,32,42,42,
    697
9A  390 DATA 0,13,17,69,82,82,79
    ,82,35,48,48,58,32,73,78,86,
    882
20  400 DATA 65,76,73,68,32,67,7
    9,77,77,65,78,68,46,17,0,13,
    901
09  410 DATA 17,69,82,82,79,82,3
    5,48,50,58,32,78,79,32,79,80
    ,982
DB  420 DATA 67,79,68,69,32,80,8
    2,69,83,69,78,84,32,0,13,17,
    922
27  430 DATA 69,82,82,79,82,35,4
    8,51,58,32,76,65,66,69,76,32
    ,1002
```

```
79 440 DATA 82,69,68,69,70,73,78,69,68,32,0,13,17,69,82,82,941
48 450 DATA 79,82,35,48,54,58,32,76,65,66,69,76,32,85,78,68,1003
5B 460 DATA 69,70,73,78,69,68,32,0,0,0,0,240,0,224,0,0,923
C8 470 DATA 65,32,81,85,73,67,75,32,72,69,76,76,79,32,84,79,1077
96 480 DATA 32,77,85,77,32,68,65,68,32,38,32,66,82,79,84,72,989
F0 490 DATA 69,82,32,67,79,76,73,78,32,32,72,73,32,84,79,32,992
EA 500 DATA 67,79,76,73,78,32,38,32,75,69,73,84,72,32,79,70,1029
BF 510 DATA 32,77,69,82,67,73,65,32,77,73,67,82,79,84,69,67,1095
29 520 DATA 72,32,32,65,78,68,32,84,79,32,75,65,82,69,78,32,975
31 530 DATA 38,32,84,65,82,65,44,32,65,78,68,32,79,70,32,67,933
6D 540 DATA 79,85,82,83,69,32,32,32,32,77,89,32,83,69,76,70,1022
24 550 DATA 32,45,32,73,65,78,32,71,79,70,70,69,32,33,33,33,847
00 560 DATA 33,32,71,79,79,68,66,89,69,32,72,65,67,75,69,82,1048
54 570 DATA 33,32,182,145,65,65,1,8,1,0,0,0,72,76,65,69,814
95 580 DATA 89,66,78,79,82,85,90,83,77,70,68,71,81,73,74,88,1254
B5 590 DATA 0,48,49,50,51,52,53,54,55,56,57,65,66,67,68,69,860
E3 600 DATA 70,0,67,157,250,110,225,115,235,124,44,129,249,110,60,151,2096
8D 610 DATA 142,151,64,152,148,151,169,152,248,119,38,153,24,154,157,155,2177
7A 620 DATA 146,120,29,156,95,158,141,158,187,158,0,0,0,0,0,0,1348
72 630 DATA 0,0,160,0,173,72,147,208,13,173,26,147,201,1,240,6,1567
13 640 DATA 230,253,208,2,230,254,173,26,147,201,1,240,16,173,72,147,2373
B1 650 DATA 208,11,165,253,141,153,132,165,254,141,154,132,96,238,153,132,2528
95 660 DATA 208,3,238,154,132,96,173,79,113,201,32,240,69,201,45,240,2224
6B 670 DATA 65,201,43,240,61,201,13,240,57,162,0,189,77,113,201,33,1896
42 680 DATA 176,5,169,48,157,77,113,232,224,4,208,239,162,0,189,17,2020
CA 690 DATA 113,205,77,113,240,9,232,224,16,208,243,32,52,114,96,160,2134
26 700 DATA 0,185,17,113,205,78,113,240,32,200,192,16,208,243,32,52,1926
AB 710 DATA 114,96,173,77,113,141,79,113,173,78,113,141,80,113,169,48,1821
9F 720 DATA 141,77,113,141,78,113,76,153,113,140,33,113,138,24,42,42,1537
A7 730 DATA 42,42,24,109,33,113,141,74,113,162,0,189,17,113,205,79,1456
51 740 DATA 113,240,9,232,224,16,208,243,32,52,114,96,160,0,185,17,1941
19 750 DATA 113,205,80,113,240,9,200,192,16,208,243,32,52,114,96,140,2053
C5 760 DATA 33,113,138,24,42,42,42,42,24,109,33,113,141,75,113,96,1180
1D 770 DATA 141,75,113,96,169,73,160,114,32,52,131,169,1,141,42,129,1638
AD 780 DATA 169,0,141,74,113,141,75,113,96,13,17,69,82,82,79,82,1346
16 790 DATA 35,48,49,58,73,78,86,65,76,73,68,32,72,69,88,32,1002
91 800 DATA 68,73,71,73,84,32,0,162,0,169,13,157,151,159,232,224,1668
43 810 DATA 40,208,248,162,0,32,169,110,32,236,110,240,251,201,20,240,2299
A2 820 DATA 15,32,182,145,157,151,159,201,13,240,4,232,76,120,114,96,1937
67 830 DATA 224,0,240,228,202,32,182,145,76,120,114,162,0,189,151,159,2224
D4 840 DATA 157,205,115,232,224,6,208,245,32,23,115,169,36,32,182,145,2126
D8 850 DATA 173,202,115,32,215,114,173,77,113,32,182,145,173,78,113,32,1969
93 860 DATA 182,145,173,201,115,32,215,114,173,77,113,32,182,145,173,78,2150
88 870 DATA 113,32,182,145,76,80,110,72,160,0,140,21,115,140,22,115,1523
B7 880 DATA 201,16,144,16,24,74,74,74,74,141,22,115,56,10,10,10,1061
D3 890 DATA 10,141,21,115,104,56,237,21,115,141,78,113,173,22,115,141,1603
EC 900 DATA 77,113,174,77,113,189,17,113,141,77,113,174,78,113,189,17,1775
10 910 DATA 113,141,78,113,96,0,0,169,0,141,201,115,141,202,115,169,1794
B7 920 DATA 48,162,0,157,215,115,232,224,6,208,248,162,0,189,205,115,2286
A9 930 DATA 201,43,240,16,201,45,240,12,201,32,240,8,201,13,240,4,1937
02 940 DATA 232,76,45,115,142,75,115,169,5,56,233,0,170,160,0,185,1778
5B 950 DATA 205,115,157,215,115,200,232,224,6,208,244,162,16,160,39,142,2440
1A 960 DATA 203,115,140,204,115,173,215,115,32,172,115,162,232,160,3,142,2298
76 970 DATA 203,115,140,204,115,173,216,115,32,172,115,162,100,160,0,142,2164
34 980 DATA 203,115,140,204,115,173,217,115,32,172,115,162,10,160,0,142,2075
92 990 DATA 203,115,140,204,115,173,218,115,32,172,115,162,1,160,0,142,2067
7D 1000 DATA 203,115,140,204,115,173,219,115,32,172,115,96,56,233,48,240,2276
5A 1010 DATA 23,170,173,201,115,24,109,203,115,141,201,115,173,202,115,109,2189
BA 1020 DATA 204,115,141,202,115,202,208,234,96,0,0,0,0,48,48,48,1661
EF 1030 DATA 48,48,88,88,88,88,88,48,48,48,48,48,88,88,88,88,1128
6D 1040 DATA 88,169,139,160,111,32,52,131,162,0,142,40,208,189,215,120,1958
AD 1050 DATA 157,64,3,232,224,64,208,245,169,65,141,244,112,141,245,112,2426
0E 1060 DATA 174,67,131,172,68,131,142,74,112,140,75,112,174,71,131,172,1946
23 1070 DATA 72,131,142,76,112,140,77,112,169,255,141,138,111,169,0,141,1986
FD 1080 DATA 72,112,141,73,112,141,26,147,141,255,148,141,171,141,141,18,1980
B2 1090 DATA 131,169,1,141,19,131,169,0,141,42,129,141,28,128,32,148,1550
05 1100 DATA 123,174,117,155,172,118,155,142,119,155,140,120,155,169,0,32,2046
9C 1110 DATA 198,128,169,255,32,198,128,173,117,155,141,119,155,173,118,155,2414
88 1120 DATA 141,120,155,165,197,201,63,208,12,169,117,160,131,32,52,131,2054
F6 1130 DATA 169,1,141,42,129,169,0,141,18,131,141,21,131,141,43,129,1547
F3 1140 DATA 173,42,129,240,6,32,231,255,76,60,120,32,1,141,173,79,1790
5C 1150 DATA 112,240,54,173,255,148,240,11,169,0,141,255,148,141,79,112,2278
07 1160 DATA 76,99,116,173,26,147,240,11,32,41,147,169,0,141,79,112,1609
60 1170 DATA 76,99,116,173,72,147,240,11,32,27,147,169,0,141,79,112,1641
8F 1180 DATA 76,99,116,76,193,117,76,193,117,173,138,111,240,30,174,21,1950
43 1190 DATA 131,189,151,159,201,33,240,139,201,92,208,6,32,111,147,76,2116
BF 1200 DATA 99,116,201,64,208,6,32,107,149,76,99,116,32,201,121,205,1832
2B 1210 DATA 151,159,173,218,124,201,65,208,32,238,130,155,32,29,128,169,2212
```

```
82  1220 DATA 0,141,138,111,173,
    21,128,208,8,173,22,128,208,
    3,76,99,1637
D6  1230 DATA 116,169,255,141,13
    8,111,76,99,116,201,66,240,6
    ,201,67,240,2242
DD  1240 DATA 2,208,6,32,99,146,
    76,99,116,173,138,111,208,6,
    32,99,1551
9B  1250 DATA 146,76,99,116,173,
    218,124,201,255,208,3,76,156
    ,121,201,68,2241
DB  1260 DATA 208,3,76,103,144,2
    01,69,208,3,76,8,145,201,70,
    208,3,1726
25  1270 DATA 76,66,145,201,71,2
    08,3,76,99,116,201,72,208,3,
    76,99,1720
46  1280 DATA 116,201,62,208,6,3
    2,228,145,76,99,116,201,63,2
    08,3,76,1840
24  1290 DATA 99,116,201,73,208,
    6,32,228,145,76,193,117,201,
    74,208,6,1983
CD  1300 DATA 32,131,146,76,99,1
    16,201,75,208,6,32,129,156,7
    6,99,116,1698
AF  1310 DATA 201,61,208,23,169,
    1,141,28,128,32,29,128,173,2
    1,128,141,1612
01  1320 DATA 26,128,173,22,128,
    141,27,128,76,99,116,201,64,
    208,15,238,1790
AB  1330 DATA 130,155,32,29,128,
    32,23,121,32,43,121,76,99,11
    6,76,99,1312
BA  1340 DATA 116,169,194,160,11
    1,32,52,131,169,0,141,40,208
    ,169,65,141,1898
11  1350 DATA 244,112,141,245,11
    2,169,2,141,19,131,169,255,1
    41,138,111,32,2162
9B  1360 DATA 148,123,165,197,20
    1,63,208,12,169,1,141,42,129
    ,169,117,160,2045
6A  1370 DATA 131,32,52,131,169,
    0,141,18,131,173,42,129,240,
    6,32,231,1658
FD  1380 DATA 255,76,60,120,162,
    0,142,43,129,160,0,32,1,141,
    173,79,1573
A5  1390 DATA 112,240,54,173,255
    ,148,240,11,169,0,141,255,14
    8,141,79,112,2278
EF  1400 DATA 76,226,117,173,26,
    147,240,11,32,41,147,169,0,1
    41,79,112,1737
25  1410 DATA 76,226,117,173,72,
    147,240,11,32,27,147,169,0,1
    41,79,112,1769
B2  1420 DATA 76,226,117,76,155,
    132,76,155,132,169,0,141,21,
    131,173,138,1918
36  1430 DATA 111,240,24,174,21,
    131,189,151,159,201,33,240,1
    33,201,92,240,2340
D8  1440 DATA 129,201,64,208,6,3
    2,107,149,76,226,117,169,0,1
    41,130,155,1910
D6  1450 DATA 32,201,121,173,218
    ,124,201,65,208,32,238,130,1
    55,32,29,128,2087
B1  1460 DATA 169,0,141,138,111,
    173,21,128,208,8,173,22,128,
    208,3,76,1707
94  1470 DATA 226,117,169,255,14
    1,138,111,76,226,117,201,66,
    240,6,201,67,2357
4C  1480 DATA 240,2,208,6,32,99,
    146,76,226,117,173,138,111,2
    08,6,32,1820
C0  1490 DATA 99,146,76,226,117,
    173,218,124,201,74,208,6,32,
    131,146,76,2053
8C  1500 DATA 226,117,201,75,208
    ,3,76,226,117,201,255,208,3,
    76,203,119,2314
AE  1510 DATA 201,44,240,10,201,
    47,240,6,201,48,240,2,208,3,
    76,30,1797
A7  1520 DATA 131,201,25,240,31,
    201,26,240,27,201,27,240,23,
    201,28,240,2082
51  1530 DATA 19,201,29,240,15,2
    01,30,240,11,201,31,240,7,20
    1,32,240,1938
B6  1540 DATA 3,76,7,119,76,42,1
    31,201,68,208,3,76,103,144,2
    01,69,1527
AF  1550 DATA 208,3,76,8,145,201
    ,70,208,3,76,66,145,201,71,2
    08,3,1692
78  1560 DATA 76,226,117,201,72,
    208,3,76,226,117,201,62,208,
    6,32,228,2059
11  1570 DATA 145,76,226,117,201
    ,63,208,3,76,226,117,201,73,
    208,6,32,1978
5C  1580 DATA 228,145,76,155,132
    ,201,61,208,23,32,29,128,173
    ,21,128,141,1881
4B  1590 DATA 26,128,173,22,128,
    141,27,128,169,1,141,28,128,
    76,226,117,1659
FE  1600 DATA 201,64,208,15,238,
    130,155,32,29,128,32,23,121,
    32,43,121,1572
D1  1610 DATA 76,226,117,174,218
    ,124,189,86,138,201,255,240,
    6,32,129,128,2339
6E  1620 DATA 76,226,117,238,130
    ,155,174,130,155,189,151,159
    ,201,35,240,30,2406
E5  1630 DATA 32,59,128,173,128,
    128,240,31,201,2,240,9,32,12
    9,128,32,1692
8D  1640 DATA 129,128,76,226,117
    ,32,129,128,32,129,128,76,22
    6,117,32,129,1834
B5  1650 DATA 128,32,129,128,76,
    226,117,32,29,128,32,129,128
    ,32,129,128,1603
6E  1660 DATA 173,22,128,240,3,3
    2,129,128,76,226,117,173,18,
    131,240,15,1851
1B  1670 DATA 169,1,141,42,129,1
    69,239,160,111,32,52,131,76,
    226,117,169,1964
D3  1680 DATA 0,141,18,131,32,16
    8,123,173,18,131,208,3,76,22
    6,117,173,1738
B9  1690 DATA 43,129,141,21,131,
    76,78,118,32,171,145,169,3,1
    41,170,145,1713
EA  1700 DATA 32,171,145,32,231,
    255,32,148,123,169,1,141,171
    ,141,32,121,1945
6F  1710 DATA 155,32,198,146,173
    ,42,129,240,6,32,27,147,76,8
    0,110,32,1625
B8  1720 DATA 1,141,165,197,201,
    63,208,5,169,1,141,79,112,17
    3,79,112,1847
C6  1730 DATA 240,237,32,27,147,
    76,80,110,73,78,32,0,169,56,
    160,120,1637
76  1740 DATA 32,52,131,174,248,
    112,173,249,112,32,205,189,1
    73,26,147,208,2263
A5  1750 DATA 8,173,72,147,208,3
    ,76,99,120,169,136,160,120,3
    2,52,131,1706
88  1760 DATA 32,237,148,169,13,
    32,210,255,173,249,112,174,2
    48,112,32,205,2401
E0  1770 DATA 189,169,32,32,210,
    255,162,0,189,151,159,32,210
    ,255,201,13,2259
7C  1780 DATA 240,3,232,208,243,
    76,80,110,13,73,78,32,70,73,
    76,69,1676
FD  1790 DATA 58,0,173,73,112,20
    8,10,169,181,160,120,32,52,1
    31,76,80,1635
D8  1800 DATA 110,173,179,120,17
    2,180,120,141,174,120,140,17
    5,120,32,255,255,2466
5F  1810 DATA 76,80,110,0,0,13,7
    8,79,32,69,88,69,67,85,84,73
    ,1003
E2  1820 DATA 79,78,32,65,68,68,
    82,69,83,83,32,83,80,69,67,7
    3,1111
34  1830 DATA 70,73,69,68,32,13,
    0,0,0,0,127,255,254,64,0,2,1
    027
EE  1840 DATA 79,255,242,79,255,
    242,79,255,246,79,255,246,79
    ,231,242,79,2943
12  1850 DATA 195,242,79,195,242
    ,79,231,242,79,254,242,79,23
    1,242,79,231,2942
5D  1860 DATA 242,79,231,242,79,
    231,242,79,231,242,79,255,24
    2,64,0,2,2540
F9  1870 DATA 127,255,254,0,0,0,
    5,24,173,26,128,109,21,128,1
    41,26,1417
B2  1880 DATA 128,173,27,128,109
    ,22,128,141,27,128,96,24,173
    ,98,131,109,1642
A9  1890 DATA 21,128,141,98,131,
    173,99,131,109,22,128,141,99
    ,131,96,13,1661
D2  1900 DATA 69,82,82,79,82,35,
    49,50,58,73,78,86,65,76,73,6
    8,1105
60  1910 DATA 32,66,73,78,65.82,
    89,32,78,85,77,66,69,82,32,0
    ,1006
3B  1920 DATA 13,69,82,82,79,82,
    35,49,55,58,69,88,80,82,69,8
    3,1075
E4  1930 DATA 83,73,79,78,32,79,
    86,69,82,70,76,79,87,32,0,13
    ,1018
4C  1940 DATA 69,82,82,79,82,35,
    49,56,58,83,89,77,66,79,76,3
    2,1094
4F  1950 DATA 84,65,66,76,69,32,
    70,85,76,76,32,0,173,18,131,
    240,1293
20  1960 DATA 15,169,1,141,42,12
    9,169,239,160,111,32,52,131,
    76,99,116,1682
54  1970 DATA 169,0,141,18,131,3
    2,168,123,173,18,131,208,3,7
    6,99,116,1606
C8  1980 DATA 173,43,129,141,21,
    131,76,201,116,169,82,141,24
    4,121,141,6,1935
CE  1990 DATA 122,141,42,122,169
    ,122,141,245,121,141,6,122,1
    41,43,122,160,1960
4F  2000 DATA 0,162,0,142,218,12
    4,172,21,131,140,130,155,185
    ,151,159,200,2090
3B  2010 DATA 238,130,155,221,82
    ,122,208,49,232,208,9,238,24
    5,121,238,6,2502
4F  2020 DATA 122,238,43,122,189
    ,82,122,201,13,208,225,185,1
    51,159,201,32,2293
```

```
44  2030 DATA 240,19,201,33,240,
    15,201,13,240,11,173,218,124
    ,201,61,240,2230
8A  2040 DATA 4,201,47,208,39,17
    3,218,124,96,189,82,122,232,
    208,9,238,2190
3B  2050 DATA 245,121,238,6,122,
    238,43,122,201,255,240,16,20
    1,13,208,233,2502
0B  2060 DATA 238,218,124,172,21
    ,131,140,130,155,76,236,121,
    169,255,141,218,2545
C9  2070 DATA 124,96,65,68,67,13
    ,65,78,68,13,65,83,76,65,13,
    65,1024
29  2080 DATA 83,76,13,66,73,84,
    13,67,77,80,13,67,80,88,13,6
    7,960
A8  2090 DATA 80,89,13,68,69,67,
    13,69,79,82,13,73,78,67,13,7
    6,949
```

PROGRAM:BLOCK2

```
ED  10 REM CBM64 MACRO ASSEMBLER
     BASIC LOADER BY IAN GOFFE 1
    989 BLOCK 2(31360-34559)
5D  20 PRINT"[CLR]":LI-100:FORA-
    31360TO34559STEP16
D7  30 C-0:FORE-ATOA+15:READL:C-
    C+L:POKEE,L:POKE53280,L
80  40 NEXTE:PRINT"[HOME]"LI
4F  50 READC1:IFC<>C1THENPRINT"E
    RROR IN LINE:"LI:END
D4  60 LI-LI+10:NEXTA
AE  70 PRINT"BLOCK 2 OK...":END
50  100 DATA 68,65,13,76,68,88,1
    3,76,68,89,13,76,83,82,65,13
    ,956
17  110 DATA 76,83,82,13,79,82,6
    5,13,82,79,76,65,13,82,79,76
    ,1045
F6  120 DATA 13,82,79,82,65,13,8
    2,79,82,13,83,66,67,13,83,84
    ,986
2F  130 DATA 65,13,83,84,88,13,8
    3,84,89,13,66,80,76,13,66,77
    ,993
7C  140 DATA 73,13,66,86,67,13,6
    6,86,83,13,66,67,67,13,66,67
    ,912
F6  150 DATA 83,13,66,78,69,13,6
    6,69,81,13,84,88,65,13,84,65
    ,950
62  160 DATA 88,13,84,89,65,13,8
    4,65,89,13,84,83,88,13,84,88
    ,1043
C5  170 DATA 83,13,80,72,80,13,8
    0,76,80,13,80,72,65,13,80,76
    ,976
09  180 DATA 65,13,66,82,75,13,7
    4,83,82,13,82,84,73,13,82,84
    ,984
8B  190 DATA 83,13,74,77,80,32,4
    0,13,74,77,80,13,78,79,80,13
    ,906
70  200 DATA 67,76,67,13,83,69,6
    7,13,67,76,73,13,83,69,73,13
    ,922
7F  210 DATA 67,76,86,13,67,76,6
    8,13,83,69,68,13,68,69,89,13
    ,938
3A  220 DATA 73,78,89,13,68,69,8
    8,13,73,78,88,13,42,61,13,76
    ,935
14  230 DATA 73,78,75,13,82,85,7
    8,13,82,69,83,13,73,70,13,69
    ,969
DD  240 DATA 78,68,73,70,13,69,7
    6,83,69,13,66,89,84,13,87,79
    ,1030
73  250 DATA 82,13,84,88,84,13,7
    6,79,65,68,13,79,85,84,13,82
    ,1008
D6  260 DATA 69,76,73,78,75,13,6
    8,73,78,67,76,85,68,69,13,83
    ,1064
D3  270 DATA 89,77,13,255,169,0,
    141,79,112,162,1,160,8,134,2
    53,132,1785
D7  280 DATA 254,142,153,132,140
    ,154,132,96,160,0,162,0,173,
    255,148,240,2341
BC  290 DATA 14,173,244,112,141,
    162,112,173,245,112,141,163,
    112,160,2,189,2255
77  300 DATA 151,159,201,13,240,
    20,201,32,240,16,201,61,240,
    12,201,33,2021
16  310 DATA 240,8,153,162,112,2
    32,200,76,191,123,169,13,153
    ,162,112,142,2248
1F  320 DATA 51,131,32,191,129,1
    73,19,131,201,1,208,18,173,2
    3,128,240,1849
69  330 DATA 13,169,1,141,42,129
    ,169,14,160,112,32,52,131,96
    ,173,19,1453
45  340 DATA 131,201,1,240,3,76,
    22,131,162,0,173,255,148,240
    ,12,173,1968
5C  350 DATA 244,112,32,198,128,
    173,245,112,32,198,128,189,1
    51,159,201,32,2334
B5  360 DATA 240,15,201,61,240,1
    1,201,13,240,7,32,198,128,23
    2,76,27,1922
BA  370 DATA 124,142,43,129,238,
    43,129,189,151,159,201,61,24
    0,92,201,32,2174
BF  380 DATA 240,13,169,1,141,42
    ,129,169,239,160,111,32,52,1
    31,96,169,1894
B1  390 DATA 1,141,18,131,173,28
    ,128,208,15,169,1,32,198,128
    ,32,146,1549
87  400 DATA 128,32,146,128,32,2
    19,124,96,169,1,141,18,131,1
    73,19,131,1688
59  410 DATA 173,19,131,32,198,1
    28,173,72,112,240,15,173,98,
    131,32,198,1925
29  420 DATA 128,173,99,131,32,1
    98,128,76,150,124,173,26,128
    ,32,198,128,1924
3A  430 DATA 173,27,128,32,198,1
    28,32,219,124,96,174,43,129,
    160,0,189,1852
93  440 DATA 151,159,201,32,240,
    12,201,13,240,8,153,217,128,
    232,200,76,2263
66  450 DATA 159,124,169,13,153,
    217,128,32,219,124,32,79,125
    ,173,23,128,1898
E4  460 DATA 240,3,76,89,124,169
    ,2,32,198,128,173,21,128,32,
    198,128,1741
D4  470 DATA 173,22,128,32,198,1
    28,32,219,124,96,0,173,19,13
    1,201,1,1677
19  480 DATA 208,8,169,255,32,19
    8,128,32,183,128,96,162,0,18
    9,153,159,2100
D7  490 DATA 157,217,128,232,224
    ,40,208,245,32,79,125,174,21
    ,128,173,22,2205
7D  500 DATA 128,32,205,189,169,
    13,32,182,145,169,36,32,182,
    145,173,22,1854
8A  510 DATA 128,32,215,114,173,
    77,113,32,182,145,173,78,113
    ,32,182,145,1934
73  520 DATA 173,21,128,32,215,1
    14,173,77,113,32,182,145,173
    ,78,113,32,1801
25  530 DATA 182,145,76,80,110,2
    38,20,128,174,20,128,189,217
    ,128,141,201,2177
0A  540 DATA 115,169,0,141,202,1
    15,238,20,128,32,165,126,76,
    99,125,169,1920
4D  550 DATA 0,141,20,128,141,25
    ,128,141,21,128,141,22,128,1
    41,23,128,1456
5B  560 DATA 141,24,128,173,23,1
    28,240,3,76,44,126,174,20,12
    8,189,217,1834
A1  570 DATA 128,201,32,240,72,2
    01,33,240,68,201,41,240,64,2
    01,13,240,2215
BB  580 DATA 60,201,41,240,56,20
    1,43,240,80,201,44,240,48,20
    1,45,240,2181
D2  590 DATA 83,201,39,240,160,2
    01,38,240,86,201,64,240,93,2
    01,94,240,2421
49  600 DATA 100,201,60,208,3,76
    ,69,126,201,62,208,3,76,80,1
    26,201,1800
0E  610 DATA 36,208,3,76,42,127,
    201,37,208,6,76,158,127,76,1
    6,126,1523
BC  620 DATA 201,46,240,8,201,91
    ,176,7,201,65,144,3,76,50,13
    0,201,1840
77  630 DATA 42,208,3,76,247,127
    ,76,91,126,238,20,128,169,0,
    141,25,1717
B8  640 DATA 128,76,99,125,238,2
    0,128,169,1,141,25,128,76,99
    ,125,238,1816
9A  650 DATA 20,128,169,2,141,25
    ,128,76,99,125,238,20,128,16
    9,3,141,1612
6C  660 DATA 25,128,76,99,125,23
    8,20,128,169,4,141,25,128,76
    ,99,125,1606
24  670 DATA 173,24,128,240,23,2
    01,2,240,8,169,0,141,22,128,
    76,44,1619
53  680 DATA 126,173,22,128,141,
    21,128,169,0,141,22,128,173,
    19,131,201,1723
01  690 DATA 1,240,17,173,23,128
    ,240,12,169,43,160,112,32,52
    ,131,169,1702
A3  700 DATA 1,141,42,129,96,169
    ,1,238,20,128,141,24,128,76,
    99,125,1558
C9  710 DATA 169,2,238,20,128,14
    1,24,128,76,99,125,174,20,12
    8,160,0,1632
0C  720 DATA 189,217,128,201,13,
    240,48,201,43,240,44,201,45,
    240,40,201,2291
F6  730 DATA 32,240,36,201,44,24
    0,32,201,33,240,28,201,41,24
    0,24,201,2034
6D  740 DATA 38,240,20,201,64,24
    0,16,201,94,240,12,153,205,1
    15,232,200,2271
90  750 DATA 238,20,128,192,5,20
    8,201,169,32,153,205,115,32,
    23,115,32,1868
2A  760 DATA 165,126,76,99,125,1
    73,25,128,201,1,240,34,201,2
    ,240,52,1888
96  770 DATA 201,3,240,67,201,4,
    240,82,173,201,115,24,109,21
    ,128,141,1950
```

```
43   780 DATA 21,128,173,202,115,
     109,22,128,141,22,128,176,80
     ,96,173,21,1735
E6   790 DATA 128,56,237,201,115,
     141,21,128,173,22,128,237,20
     2,115,141,22,2067
B4   800 DATA 128,144,58,96,173,2
     1,128,45,201,115,141,21,128,
     173,22,128,1722
37   810 DATA 45,202,115,141,22,1
     28,96,173,21,128,13,201,115,
     141,21,128,1690
1A   820 DATA 173,22,128,13,202,1
     15,141,22,128,96,173,21,128,
     77,201,115,1755
52   830 DATA 141,21,128,173,22,1
     28,77,202,115,141,22,128,96,
     169,96,160,1819
1A   840 DATA 121,32,52,131,169,1
     ,141,42,129,96,162,0,172,20,
     128,185,1581
85   850 DATA 218,128,157,77,113,
     200,232,224,4,208,244,238,20
     ,128,174,20,2385
DC   860 DATA 128,189,219,128,201
     ,32,240,51,201,45,240,47,201
     ,43,240,43,2248
71   870 DATA 201,38,240,39,201,6
     4,240,35,201,94,240,31,201,1
     3,240,27,2105
B5   880 DATA 201,33,240,23,201,4
     1,240,19,201,44,240,15,238,2
     0,128,238,2122
52   890 DATA 20,128,238,20,128,2
     38,20,128,76,137,127,238,20,
     128,238,20,1904
D0   900 DATA 128,169,32,141,79,1
     13,141,80,113,32,134,113,173
     ,75,113,141,1777
74   910 DATA 201,115,173,74,113,
     141,202,115,32,165,126,76,99
     ,125,238,20,2015
1E   920 DATA 128,174,20,128,160,
     0,189,217,128,153,12,128,232
     ,238,20,128,2055
5D   930 DATA 200,192,8,208,241,3
     2,190,127,32,165,126,76,99,1
     25,162,0,1983
F8   940 DATA 142,201,115,142,202
     ,115,162,8,189,11,128,201,49
     ,240,15,201,2121
F0   950 DATA 48,208,23,173,201,1
     15,24,106,141,201,115,76,230
     ,127,173,201,2162
13   960 DATA 115,56,106,141,201,
     115,202,208,223,96,169,63,16
     0,121,32,52,2060
DE   970 DATA 131,169,1,141,42,12
     9,96,173,26,128,141,201,115,
     173,27,128,1821
7B   980 DATA 141,202,115,32,165,
     126,238,20,128,76,99,125,48,
     48,48,48,1659
3F   990 DATA 48,48,48,48,0,0,0,0
     ,0,0,80,195,0,174,130,155,92
     6
E7   1000 DATA 160,0,189,151,159,
     201,13,240,9,153,217,128,232
     ,200,192,80,2324
80   1010 DATA 208,240,169,13,153
     ,217,128,32,79,125,96,169,0,
     141,128,128,2026
14   1020 DATA 162,0,189,151,159,
     201,33,240,25,201,13,240,21,
     201,41,240,2117
57   1030 DATA 4,232,76,66,128,20
     2,189,151,159,201,88,208,6,1
     69,1,141,2021
73   1040 DATA 128,128,96,232,232
     ,232,189,151,159,201,89,208,
     6,169,2,141,2363
62   1050 DATA 128,128,96,169,225
     ,160,131,32,52,131,169,1,141
     ,42,129,96,1830
87   1060 DATA 0,238,98,131,208,3
     ,238,99,131,238,26,128,208,3
     ,238,27,2014
9B   1070 DATA 128,96,238,119,155
     ,208,3,238,120,155,173,119,1
     55,205,65,131,2308
0C   1080 DATA 208,20,173,120,155
     ,205,66,131,208,12,169,127,1
     60,121,32,52,1959
9F   1090 DATA 131,169,1,141,42,1
     29,96,56,173,119,155,233,1,1
     41,119,155,1861
F8   1100 DATA 176,3,206,120,155,
     96,172,119,155,140,211,128,1
     72,120,155,140,2268
37   1110 DATA 212,128,141,255,25
     5,32,146,128,96,32,32,32,32,
     32,32,32,1617
D1   1120 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
5B   1130 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
ED   1140 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
F7   1150 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
E0   1160 DATA 32,32,32,32,32,32,
     32,32,32,13,0,0,160,0,174,11
     7,752
D2   1170 DATA 155,173,118,155,13
     4,251,133,252,169,3,141,170,
     145,32,122,145,2298
58   1180 DATA 160,0,32,75,131,20
     1,255,240,17,201,1,240,16,20
     1,2,240,2012
1A   1190 DATA 17,32,182,145,32,1
     68,129,76,64,129,76,80,110,1
     69,42,32,1483
7E   1200 DATA 182,145,169,32,32,
     182,145,32,168,129,32,168,12
     9,32,75,131,1783
4A   1210 DATA 32,215,114,173,77,
     113,32,182,145,173,78,113,32
     ,182,145,32,1838
67   1220 DATA 177,129,32,75,131,
     32,215,114,173,77,113,32,182
     ,145,173,78,1878
DA   1230 DATA 113,32,182,145,32,
     168,129,32,168,129,169,13,32
     ,182,145,165,1836
29   1240 DATA 197,201,63,208,155
     ,76,80,110,230,251,208,2,230
     ,252,160,0,2423
9A   1250 DATA 96,56,165,251,233,
     1,133,251,176,2,198,252,160,
     0,96,160,2230
99   1260 DATA 0,173,117,155,133,
     251,173,118,155,133,252,162,
     0,160,0,32,2014
2F   1270 DATA 75,131,201,255,240
     ,74,201,1,240,14,201,2,240,1
     0,157,80,2122
32   1280 DATA 112,232,32,168,129
     ,76,207,129,169,13,157,80,11
     2,160,0,185,1961
78   1290 DATA 162,112,201,13,240
     ,12,217,80,112,208,4,200,76,
     239,129,76,2081
F9   1300 DATA 38,130,185,80,112,
     201,13,208,29,169,1,141,23,1
     28,173,19,1650
74   1310 DATA 131,201,1,240,10,1
     65,251,141,119,155,165,252,1
     41,120,155,96,2343
3B   1320 DATA 169,0,141,23,128,9
     6,32,168,129,32,168,129,32,1
     68,129,76,1620
2D   1330 DATA 203,129,169,0,141,
     23,128,174,20,128,160,0,173,
     255,148,240,2091
80   1340 DATA 28,189,217,128,201
     ,46,208,7,232,238,20,128,76,
     93,130,173,2114
D5   1350 DATA 244,112,141,162,11
     2,173,245,112,141,163,112,16
     0,2,189,217,128,2413
51   1360 DATA 201,13,240,43,201,
     43,240,39,201,45,240,35,201,
     32,240,31,2045
5C   1370 DATA 201,44,240,27,201,
     41,240,23,201,64,240,19,201,
     94,240,15,2091
B1   1380 DATA 201,38,240,11,153,
     162,112,232,238,20,128,200,7
     6,93,130,169,2203
7B   1390 DATA 13,153,162,112,160
     ,0,173,117,155,133,251,173,1
     18,155,133,252,2260
BB   1400 DATA 162,0,160,0,32,75,
     131,201,255,240,83,201,1,240
     ,14,201,1996
DB   1410 DATA 2,240,10,157,80,11
     2,232,32,168,129,76,164,130,
     169,13,157,1871
DA   1420 DATA 80,112,160,0,185,1
     62,112,201,13,240,12,217,80,
     112,208,4,1898
4A   1430 DATA 200,76,196,130,76,
     6,131,185,80,112,201,13,208,
     40,169,0,1823
22   1440 DATA 141,23,128,32,168,
     129,32,75,131,141,201,115,32
     ,168,129,32,1677
AC   1450 DATA 75,131,141,202,115
     ,32,168,129,32,165,126,76,99
     ,125,169,1,1786
05   1460 DATA 141,23,128,76,99,1
     25,32,168,129,32,168,129,32,
     168,129,76,1655
08   1470 DATA 160,130,0,0,0,0,20
     1,2,174,51,131,76,49,124,32,
     129,1259
C6   1480 DATA 128,32,129,128,32,
     129,128,76,226,117,32,129,12
     8,32,129,128,1703
48   1490 DATA 76,226,117,0,72,15
     2,72,32,231,255,104,168,104,
     32,30,171,1842
BF   1500 DATA 96,255,191,0,240,2
     55,255,0,224,255,239,120,169
     ,44,133,1,2477
1E   1510 DATA 177,251,141,74,143
     ,169,55,133,1,173,74,143,88,
     96,0,0,1718
F3   1520 DATA 0,0,0,0,13,13,42,4
     2,32,80,65,83,83,32,51,32,56
     8
B7   1530 DATA 42,42,13,13,0,13,1
     3,66,82,69,65,75,32,79,85,84
     ,773
14   1540 DATA 32,79,70,32,65,83,
     83,69,77,66,76,89,32,0,32,32
     ,917
01   1550 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
BB   1560 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
9D   1570 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
A7   1580 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
```



```
B6  1590 DATA 32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,13,493
B5  1600 DATA 0,13,69,82,82,79,82,35,48,52,58,32,73,76,76,69,926
AB  1610 DATA 71,65,76,32,65,68,68,82,69,83,83,73,78,71,32,77,1093
6B  1620 DATA 79,68,69,32,0,13,69,82,82,79,82,35,48,53,58,32,881
5A  1630 DATA 78,79,84,32,90,69,82,79,32,80,65,71,69,32,0,13,955
2C  1640 DATA 69,82,82,79,82,35,48,55,58,32,73,78,86,65,76,73,1073
4C  1650 DATA 68,32,73,78,68,69,88,32,0,13,69,82,82,79,82,35,950
E8  1660 DATA 48,56,58,32,66,82,65,78,67,72,32,84,79,79,32,70,1000
45  1670 DATA 65,82,32,0,13,69,82,82,79,82,35,48,57,58,32,85,901
33  1680 DATA 78,68,69,70,73,78,69,68,32,77,65,67,82,79,32,67,1074
A0  1690 DATA 65,76,76,32,0,13,69,82,82,79,82,35,49,48,58,32,878
BA  1700 DATA 77,65,67,82,79,32,80,65,82,65,77,69,84,69,82,32,1107
F3  1710 DATA 77,73,83,83,73,78,71,32,0,0,0,169,100,160,131,32,1162
66  1720 DATA 52,131,169,0,141,40,208,169,65,141,244,112,141,245,112,32,2002
5A  1730 DATA 231,255,169,3,141,19,131,169,0,141,170,145,141,224,131,169,2239
1E  1740 DATA 255,141,138,111,32,148,123,165,197,201,63,208,12,169,117,160,2240
C9  1750 DATA 131,32,52,131,169,1,141,42,129,169,0,141,148,138,173,42,1639
31  1760 DATA 129,240,6,32,231,255,76,60,120,173,224,131,208,3,76,110,2074
69  1770 DATA 133,169,32,32,182,145,169,0,141,21,131,32,201,121,173,218,1900
6C  1780 DATA 124,201,255,240,23,169,0,141,130,155,169,22,56,237,226,145,2293
DB  1790 DATA 168,169,32,32,182,145,136,208,250,76,93,133,169,14,56,237,2100
C8  1800 DATA 226,145,168,169,32,32,182,145,136,208,250,162,0,142,130,155,2282
C3  1810 DATA 189,151,159,201,13,208,3,76,110,133,201,61,240,21,201,32,1999
55  1820 DATA 240,17,224,7,176,3,32,182,145,174,130,155,232,142,130,155,2144
F5  1830 DATA 76,48,133,201,32,208,3,238,130,155,76,10,133,174,130,155,1902
6B  1840 DATA 189,151,159,201,13,240,7,32,182,145,232,76,96,133,173,224,2253
27  1850 DATA 131,240,46,169,13,32,182,145,173,27,128,32,215,114,173,77,1897
A5  1860 DATA 113,32,182,145,173,78,113,32,182,145,173,26,128,32,215,114,1883
79  1870 DATA 173,77,113,32,182,145,173,78,113,32,182,145,169,32,32,182,1860
6C  1880 DATA 145,169,0,141,18,131,162,0,142,43,129,160,0,32,1,141,1414
0A  1890 DATA 173,79,112,240,61,173,255,148,240,11,169,0,141,255,148,141,2346
83  1900 DATA 79,112,76,199,132,173,26,147,240,16,32,41,147,169,0,141,1730
DE  1910 DATA 79,112,169,13,141,151,159,76,199,132,173,72,147,240,16,32,1911
BC  1920 DATA 27,147,169,0,141,79,112,169,13,141,151,159,76,199,132,76,1791
65  1930 DATA 141,154,169,0,141,21,131,173,138,111,240,30,174,21,131,189,1964
27  1940 DATA 151,159,201,33,208,3,76,199,132,201,92,208,3,76,199,132,2073
4E  1950 DATA 201,64,208,6,32,107,149,76,199,132,169,0,141,130,155,32,1801
3C  1960 DATA 201,121,173,218,124,201,65,208,38,238,130,155,32,29,128,141,2202
00  1970 DATA 224,131,169,0,141,138,111,173,21,128,208,8,173,22,128,208,1983
63  1980 DATA 3,76,199,132,169,255,141,224,131,141,138,111,76,199,132,173,2300
99  1990 DATA 138,111,208,6,32,99,146,76,199,132,173,218,124,201,66,240,2169
B8  2000 DATA 6,201,67,240,2,208,6,32,99,146,76,199,132,201,255,208,2078
EE  2010 DATA 3,76,19,138,201,44,240,10,201,47,240,6,201,48,240,2,1716
D9  2020 DATA 208,3,76,49,138,201,25,240,31,201,26,240,27,201,27,240,1933
EE  2030 DATA 23,201,28,240,19,201,29,240,15,201,30,240,11,201,31,240,1950
F5  2040 DATA 7,201,32,240,3,76,171,134,76,210,143,201,68,208,3,76,1849
A8  2050 DATA 103,144,201,69,208,3,76,8,145,201,70,208,3,76,66,145,1726
56  2060 DATA 201,72,208,17,238,130,155,32,29,128,32,113,145,169,1,141,1811
15  2070 DATA 224,131,76,199,132,201,71,208,32,238,130,155,32,29,128,173,2159
81  2080 DATA 21,128,141,98,131,141,96,131,173,22,128,141,99,131,141,97,1819
D8  2090 DATA 131,169,1,141,72,112,76,199,132,201,62,208,6,32,228,145,1915
```

PROGRAM: BLOCK3

```
2A  10 REM CBM64 MACRO ASSEMBLER BASIC LOADER BY IAN GOFFE 1989 BLOCK3(34560-37759)
33  20 PRINT"[CLR]":LI=100:FORA=34560TO37759STEP16
D7  30 C=0:FORE=ATOA+15:READL:C=C+L:POKEE,L:POKE53280,L
80  40 NEXTE:PRINT"[HOME]"LI
4F  50 READC1:IFC<>C1THENPRINT"ERROR IN LINE:"LI:END
D4  60 LI=LI+10:NEXTA
C9  70 PRINT"BLOCK 3 OK...":END
E7  100 DATA 76,199,132,201,63,208,26,238,130,155,32,29,128,173,21,128,1939
6A  110 DATA 141,179,120,173,22,128,141,180,120,169,1,141,73,112,76,199,1975
F3  120 DATA 132,201,73,208,3,76,141,154,201,74,208,6,32,131,146,76,1862
8A  130 DATA 199,132,201,75,208,3,76,199,132,201,61,208,29,32,29,128,1913
3C  140 DATA 173,21,128,141,26,128,141,94,131,173,22,128,141,27,128,141,1743
FB  150 DATA 95,131,169,1,141,28,128,76,199,132,201,64,208,15,238,130,1956
74  160 DATA 155,32,29,128,32,23,121,32,43,121,76,199,132,174,218,124,1639
D7  170 DATA 189,86,138,201,255,240,6,32,173,137,76,199,132,238,130,155,2387
04  180 DATA 174,130,155,189,151,159,201,35,208,3,76,26,136,32,59,128,1862
EE  190 DATA 173,128,128,208,3,76,89,136,201,2,240,63,238,130,155,32,2002
55  200 DATA 29,128,173,22,128,240,15,169,5,160,132,32,52,131,169,1,1586
B3  210 DATA 141,42,129,76,199,132,174,218,124,189,64,140,201,255,208,15,2307
D7  220 DATA 169,225,160,131,32,52,131,169,1,141,42,129,76,199,132,32,1821
76  230 DATA 173,137,173,21,128,32,173,137,76,199,132,238,130,155,32,29,1965
C6  240 DATA 128,173,22,128,240,15,169,5,160,132,32,52,131,169,1,141,1698
5F  250 DATA 42,129,76,199,132,174,218,124,189,125,140,201,255,208,15,169,2396
FD  260 DATA 225,160,131,32,52,131,169,1,141,42,129,76,199,132,32,173,1825
44  270 DATA 137,173,21,128,32,173,137,76,199,132,238,130,155,32,29,128,1920
A0  280 DATA 174,218,124,189,149,138,201,255,208,15,169,225,160,131,32,52,2440
D2  290 DATA 131,169,1,141,42,129,76,199,132,32,173,137,173,22,128,240,1925
15  300 DATA 15,169,5,160,132,32,52,131,169,1,141,42,129,76,199,132,1585
4C  310 DATA 173,21,128,32,173,137,76,199,132,32,29,128,32,109,137,173,1711
22  320 DATA 147,138,240,106,201,2,240,51,173,22,128,208,3,76,35,137,1907
59  330 DATA 174,218,124,189,77,139,201,255,208,15,169,225,160,131,32,52,2369
```

```
84  340 DATA 131,169,1,141,42,12
    9,76,199,132,32,173,137,173,
    21,128,32,1716
47  350 DATA 173,137,173,22,128,
    32,173,137,76,199,132,173,22
    ,128,208,3,1916
58  360 DATA 76,72,137,174,218,1
    24,189,138,139,201,255,208,1
    5,169,225,160,2500
CE  370 DATA 131,32,52,131,169,1
    ,141,42,129,76,199,132,32,17
    3,137,173,1750
26  380 DATA 21,128,32,173,137,1
    73,22,128,32,173,137,76,199,
    132,173,22,1758
9A  390 DATA 128,240,43,174,218,
    124,189,15,139,201,255,208,1
    5,169,225,160,2503
68  400 DATA 131,32,52,131,169,1
    ,141,42,129,76,199,132,32,17
    3,137,173,1750
DF  410 DATA 21,128,32,173,137,1
    73,22,128,32,173,137,76,199,
    132,174,218,1955
08  420 DATA 124,189,210,138,201
    ,255,208,15,169,225,160,131,
    32,52,131,169,2409
78  430 DATA 1,141,42,129,76,199
    ,132,32,173,137,173,21,128,3
    2,173,137,1726
72  440 DATA 76,199,132,174,218,
    124,189,199,139,201,255,208,
    15,169,225,160,2683
9E  450 DATA 131,32,52,131,169,1
    ,141,42,129,76,199,132,32,17
    3,137,173,1750
BE  460 DATA 21,128,32,173,137,7
    6,199,132,174,218,124,189,4,
    140,201,255,2203
48  470 DATA 208,15,169,225,160,
    131,32,52,131,169,1,141,42,1
    29,76,199,1880
92  480 DATA 132,32,173,137,173,
    21,128,32,173,137,76,199,132
    ,160,0,185,1890
EE  490 DATA 151,159,201,33,240,
    49,201,13,240,45,201,44,240,
    4,200,76,2097
1D  500 DATA 111,137,200,185,151
    ,159,201,88,208,6,169,1,141,
    147,138,96,2138
E0  510 DATA 201,89,208,6,169,2,
    141,147,138,96,169,31,160,13
    2,32,52,1773
4D  520 DATA 131,169,1,141,42,12
    9,96,169,0,141,147,138,96,14
    1,74,143,1758
DC  530 DATA 173,42,129,208,93,1
    73,72,112,240,13,174,98,131,
    134,63,174,2029
37  540 DATA 99,131,134,64,76,21
    2,137,173,74,143,174,26,128,
    134,63,174,1942
E9  550 DATA 27,128,134,64,173,7
    4,143,160,0,145,63,32,215,11
    4,173,77,1722
C9  560 DATA 113,32,182,145,173,
    78,113,32,182,145,32,129,128
    ,238,148,138,2008
BF  570 DATA 173,148,138,201,4,2
    08,27,169,0,141,148,138,169,
    13,32,182,1891
BB  580 DATA 145,169,32,32,182,1
    45,32,182,145,32,182,145,32,
    182,145,32,1814
23  590 DATA 182,145,96,162,0,18
    9,151,159,201,61,240,8,201,3
    2,240,10,2077
06  600 DATA 232,76,21,138,32,16
    8,123,76,199,132,232,142,21,
    131,76,247,2046
EB  610 DATA 133,173,218,124,201
    ,47,240,3,238,130,155,32,29,
    128,174,218,2243
44  620 DATA 124,189,86,138,32,1
    73,137,173,21,128,32,173,137
    ,173,22,128,1866
2B  630 DATA 32,173,137,76,199,1
    32,255,255,10,255,255,255,25
    5,255,255,255,3054
10  640 DATA 255,255,255,255,74,
    255,255,42,255,106,255,255,2
    55,255,255,16,3298
C4  650 DATA 48,80,112,144,176,2
    08,240,138,170,152,168,186,1
    54,8,40,72,2096
73  660 DATA 104,0,32,64,96,108,
    76,234,24,56,88,120,184,216,
    248,136,1786
28  670 DATA 200,202,232,0,0,105
    ,41,255,255,255,201,224,192,
    255,73,255,2745
83  680 DATA 169,162,160,255,255
    ,9,255,255,255,255,233,255,2
    55,255,255,255,3538
DB  690 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,4080
D1  700 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,4080
69  710 DATA 255,255,101,37,255,
    6,36,197,228,196,198,69,230,
    165,166,164,2558
DE  720 DATA 255,70,5,255,38,255
    ,102,229,133,134,132,255,255
    ,255,255,255,2883
73  730 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,4080
F4  740 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,109,3934
1E  750 DATA 45,255,14,44,205,23
    6,204,206,77,238,173,174,172
    ,255,78,13,2389
91  760 DATA 255,46,255,110,237,
    141,142,140,255,255,255,255,
    255,255,255,255,3366
2A  770 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,4080
7A  780 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,125,61,255,3756
42  790 DATA 30,255,221,255,255,
    222,93,254,189,255,188,255,9
    4,29,255,62,2912
41  800 DATA 255,126,253,157,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,3851
42  810 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,4080
8C  820 DATA 25,255,255,255,255,
    255,255,255,255,255,121,57,2
    55,255,255,217,3480
7E  830 DATA 255,255,255,89,255,
    185,190,255,255,255,25,255,2
    55,255,255,249,3543
F4  840 DATA 153,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,3978
3F  850 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,25,255,255,3850
01  860 DATA 255,255,255,255,255
    ,255,255,117,53,255,22,255,2
    13,255,255,214,3424
67  870 DATA 85,246,181,255,180,
    255,86,21,255,54,255,118,245
    ,149,255,148,2788
9C  880 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,4080
1B  890 DATA 255,255,255,255,255
    ,255,255,255,255,255,25,255,
    255,255,255,255,3850
A8  900 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,4080
41  910 DATA 182,255,255,255,255
    ,255,255,255,255,255,255,150
    ,255,255,255,255,3902
34  920 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,4080
2B  930 DATA 255,255,255,255,255
    ,255,25,255,255,255,255,255,
    255,255,255,255,3850
C7  940 DATA 97,33,255,255,255,1
    93,255,255,65,255,161,25
    5,255,255,255,3354
78  950 DATA 1,255,255,255,255,2
    25,129,255,255,255,255,255,2
    55,255,255,255,3670
EC  960 DATA 255,255,255,255,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,4080
F3  970 DATA 255,255,255,25,255,
    255,255,255,255,255,255,255,
    255,113,49,255,3502
9B  980 DATA 255,255,209,255,255
    ,255,81,255,177,255,255,255,
    255,17,255,255,3544
48  990 DATA 255,255,241,145,255
    ,255,255,255,255,255,255,255
    ,255,255,255,255,3956
04  1000 DATA 255,255,255,255,25
    5,255,255,255,255,255,255,25
    5,255,255,255,255,4080
14  1010 DATA 25,255,255,255,255
    ,255,255,255,255,255,173,26,
    147,201,1,240,3108
04  1020 DATA 37,173,72,147,208,
    5,160,0,177,253,96,138,72,17
    3,170,145,2026
2A  1030 DATA 240,5,162,32,32,19
    8,255,32,207,255,141,74,143,
    238,39,208,2261
66  1040 DATA 104,170,173,74,143
    ,96,138,72,173,170,145,240,5
    ,162,10,32,1907
4D  1050 DATA 198,255,32,207,255
    ,238,39,208,141,74,143,104,1
    70,173,74,143,2454
10  1060 DATA 96,173,255,148,240
    ,4,32,72,150,96,32,25,141,17
    3,26,147,1810
A7  1070 DATA 201,1,240,1,96,32,
    0,149,96,173,26,147,201,1,24
    0,15,1619
9D  1080 DATA 173,72,147,208,10,
    165,253,141,153,132,165,254,
    141,154,132,160,2460
01  1090 DATA 0,173,171,141,240,
    10,169,13,32,182,145,169,32,
    32,182,145,1836
A6  1100 DATA 32,186,140,141,169
    ,141,32,82,113,32,186,140,14
    1,170,141,32,1878
AC  1110 DATA 82,113,173,169,141
    ,208,11,173,170,141,208,6,16
    9,1,141,79,1985
67  1120 DATA 112,96,32,186,140,
    141,248,112,32,82,113,32,186
    ,140,141,249,2042
C6  1130 DATA 112,173,171,141,24
    0,14,174,248,112,173,249,112
    ,32,205,189,169,2514
E8  1140 DATA 32,32,182,145,32,8
    2,113,162,0,32,186,140,32,17
    2,141,32,1515
```

```
63  1150 DATA 82,113,173,153,132
    ,205,169,141,208,239,173,154
    ,132,205,170,141,2590
C0  1160 DATA 208,231,202,169,13
    ,157,151,159,96,0,0,0,141,74
    ,143,201,1945
1A  1170 DATA 204,176,37,201,170
    ,240,52,201,171,240,53,201,1
    72,240,54,201,2613
54  1180 DATA 173,240,55,201,174
    ,240,56,201,177,240,57,201,1
    78,240,58,201,2692
63  1190 DATA 179,240,59,173,74,
    143,48,59,157,151,159,141,74
    ,143,232,173,2205
4E  1200 DATA 171,141,240,6,173,
    74,143,32,182,145,96,169,43,
    76,216,141,2048
C9  1210 DATA 169,45,76,216,141,
    169,42,76,216,141,169,47,76,
    216,141,169,2109
72  1220 DATA 94,76,216,141,169,
    62,76,216,141,169,61,76,216,
    141,169,60,2083
3D  1230 DATA 76,216,141,56,233,
    129,141,68,143,169,0,141,73,
    143,169,158,2056
14  1240 DATA 133,63,169,160,133
    ,64,160,0,173,68,143,201,255
    ,240,35,160,2157
E3  1250 DATA 0,177,63,48,9,230,
    63,208,2,230,64,76,47,142,17
    3,73,1605
BF  1260 DATA 143,205,68,143,240
    ,6,238,73,143,76,53,142,230,
    63,208,2,2033
C5  1270 DATA 230,64,160,0,177,6
    3,141,74,143,48,27,230,63,20
    8,2,230,1860
B1  1280 DATA 64,173,171,141,240
    ,6,173,74,143,32,182,145,173
    ,74,143,157,2091
01  1290 DATA 151,159,232,76,82,
    142,41,127,141,74,143,173,17
    1,141,240,6,2099
D3  1300 DATA 173,74,143,32,182,
    145,173,74,143,157,151,159,2
    32,96,13,69,2016
F7  1310 DATA 82,82,79,82,35,49,
    57,58,77,65,67,82,79,32,68,7
    3,1067
04  1320 DATA 82,69,67,84,79,82,
    89,32,70,85,76,76,32,0,13,69
    ,1005
9A  1330 DATA 82,82,79,82,35,50,
    48,58,77,65,67,82,79,32,76,7
    3,1067
67  1340 DATA 66,82,65,82,89,32,
    70,85,76,76,32,0,13,69,82,82
    ,1001
AD  1350 DATA 79,82,35,49,51,58,
    68,69,86,73,67,69,32,79,70,7
    0,1037
5E  1360 DATA 45,76,73,78,69,32,
    0,13,69,82,82,79,82,35,49,52
    ,916
12  1370 DATA 58,78,69,83,84,69,
    68,32,77,65,67,82,79,32,67,6
    5,1075
85  1380 DATA 76,76,32,0,13,69,8
    2,82,79,82,35,49,53,58,78,69
    ,933
D9  1390 DATA 83,84,69,68,32,73,
    78,67,76,85,68,69,68,32,70,7
    3,1095
DD  1400 DATA 76,69,32,0,13,69,8
    2,82,79,82,35,49,54,58,78,69
    ,927
01  1410 DATA 83,84,69,68,32,73,
    78,67,76,85,68,69,47,77,65,6
    7,1108
EE  1420 DATA 82,79,32,0,0,0,0,0
    ,240,0,0,0,13,69,82,82,679
9E  1430 DATA 79,82,35,49,49,58,
    70,73,76,69,78,65,77,69,32,7
    8,1039
D8  1440 DATA 79,84,32,70,79,85,
    78,68,47,73,79,32,69,82,82,7
    9,1118
94  1450 DATA 82,32,0,13,77,65,6
    7,82,79,32,65,83,83,69,77,66
    ,972
8C  1460 DATA 76,69,82,32,68,79,
    83,32,83,85,80,80,79,82,84,3
    2,1126
0F  1470 DATA 32,32,32,32,32,32,
    32,32,32,32,32,32,84,89,80,6
    9,706
AE  1480 DATA 32,68,79,83,32,67,
    79,77,77,65,78,68,46,46,13,8
    8,998
BB  1490 DATA 45,69,88,73,84,32,
    82,69,84,85,82,78,45,82,69,6
    5,1132
DF  1500 DATA 68,32,69,82,82,79,
    82,32,67,72,65,78,78,69,76,1
    3,1044
71  1510 DATA 13,0,238,130,155,3
    2,29,128,56,173,26,128,237,2
    1,128,173,1667
AC  1520 DATA 27,128,237,22,128,
    48,36,56,173,26,128,237,21,1
    28,141,201,1737
A2  1530 DATA 115,173,27,128,237
    ,22,128,208,95,173,201,115,2
    01,127,176,88,2214
06  1540 DATA 73,255,141,201,115
    ,238,201,115,76,56,144,56,17
    3,21,128,237,2230
1C  1550 DATA 26,128,141,201,115
    ,201,130,176,63,56,173,21,12
    8,237,26,128,1950
16  1560 DATA 173,22,128,237,27,
    128,208,48,56,173,21,128,237
    ,26,128,141,1881
7D  1570 DATA 201,115,173,22,128
    ,237,27,128,173,201,115,56,2
    33,2,141,201,2153
4E  1580 DATA 115,208,3,206,202,
    115,174,218,124,189,86,138,3
    2,173,137,173,2293
8D  1590 DATA 201,115,32,173,137
    ,76,199,132,169,57,160,132,3
    2,52,131,169,1967
BD  1600 DATA 1,141,42,129,76,19
    9,132,169,0,141,69,143,238,1
    30,155,174,1939
9F  1610 DATA 130,155,189,151,15
    9,201,34,240,92,201,13,240,6
    8,173,69,143,2258
B4  1620 DATA 208,109,32,29,128,
    173,19,131,201,3,208,3,76,14
    9,144,32,1645
AC  1630 DATA 129,128,76,175,144
    ,173,22,128,240,15,169,1,141
    ,42,129,169,1881
12  1640 DATA 5,160,132,32,52,13
    1,76,193,144,173,21,128,32,1
    73,137,173,1762
6C  1650 DATA 20,128,24,109,130,
    155,141,130,155,170,189,151,
    159,201,44,240,2146
5C  1660 DATA 171,173,19,131,201
    ,1,208,3,76,99,116,201,2,208
    ,3,76,1688
70  1670 DATA 226,117,76,199,132
    ,173,69,143,73,255,141,69,14
    3,208,13,238,2275
25  1680 DATA 130,155,174,130,15
    5,189,151,159,201,44,208,213
    ,76,108,144,174,2411
33  1690 DATA 130,155,173,19,131
    ,201,3,208,9,189,151,159,32,
    173,137,76,1946
7E  1700 DATA 108,144,32,129,128
    ,76,108,144,238,130,155,32,2
    9,128,173,19,1773
F5  1710 DATA 131,201,3,208,3,76
    ,33,145,32,129,128,32,129,12
    8,76,45,1499
68  1720 DATA 145,173,21,128,32,
    173,137,173,22,128,32,173,13
    7,173,20,128,1795
12  1730 DATA 24,109,130,155,141
    ,130,155,170,189,151,159,201
    ,44,240,201,76,2275
21  1740 DATA 193,144,238,130,15
    5,238,130,155,174,130,155,23
    8,130,155,189,151,2705
37  1750 DATA 159,201,34,240,25,
    201,13,240,21,168,173,19,131
    ,201,3,240,2069
1F  1760 DATA 6,32,129,128,76,72
    ,145,152,32,173,137,76,72,14
    5,76,193,1644
32  1770 DATA 144,32,171,145,173
    ,21,128,141,170,145,169,0,32
    ,189,255,169,2084
4A  1780 DATA 4,174,170,145,160,
    255,32,186,255,32,192,255,16
    2,4,32,201,2259
93  1790 DATA 255,169,13,32,210,
    255,32,174,255,165,144,41,12
    8,240,10,169,2292
9A  1800 DATA 204,141,42,129,160
    ,142,32,52,131,96,0,169,13,3
    2,182,145,1670
90  1810 DATA 169,4,32,195,255,9
    6,72,201,13,208,5,169,0,141,
    226,145,1931
50  1820 DATA 173,19,131,240,10,
    173,170,145,208,5,104,238,22
    6,145,96,142,2225
FF  1830 DATA 227,145,162,4,32,2
    01,255,104,32,210,255,238,22
    6,145,174,227,2637
F4  1840 DATA 145,96,0,0,169,0,1
    41,125,155,168,238,130,155,2
    38,130,155,2045
34  1850 DATA 174,130,155,189,15
    1,159,201,34,240,15,201,13,2
    40,11,238,125,2276
1F  1860 DATA 155,153,131,155,20
    0,232,76,243,145,32,231,255,
    173,116,155,201,2653
8B  1870 DATA 1,208,13,169,118,1
    60,148,32,52,131,32,237,148,
    32,147,148,1776
EE  1880 DATA 173,116,155,170,16
    0,0,32,186,255,173,125,155,1
    62,131,160,155,2308
6F  1890 DATA 32,189,255,169,0,1
    62,1,160,8,32,213,255,144,30
    ,169,45,1864
7D  1900 DATA 160,148,32,52,131,
    32,237,148,32,147,148,201,63
    ,208,209,169,2117
41  1910 DATA 76,160,143,32,52,1
    31,169,1,141,42,129,96,32,12
    2,145,32,1503
4B  1920 DATA 148,123,96,173,218
    ,124,201,67,208,12,173,138,1
    11,73,255,141,2261
7B  1930 DATA 138,111,141,224,13
    1,96,201,66,208,8,169,255,14
    1,138,111,141,2279
6F  1940 DATA 224,131,96,173,72,
    147,240,13,169,4,160,143,32,
    52,131,169,1956
9B  1950 DATA 1,141,42,129,96,32
    ,27,147,32,246,151,32,231,25
    5,238,130,1930
```

```
32  1960 DATA 155,238,130,155,17
    4,130,155,160,0,140,125,155,
    189,151,159,201,2417
41  1970 DATA 34,240,19,201,32,2
    40,15,201,13,240,11,153,131,
    155,232,200,2117
38  1980 DATA 238,125,155,76,172
    ,146,173,125,155,162,131,160
    ,155,32,189,255,2449
FE  1990 DATA 169,32,174,116,155
    ,160,0,32,186,255,32,192,255
    ,162,32,142,2094
47  2000 DATA 72,147,32,198,255,
    169,1,141,153,132,169,8,141,
    154,132,173,2077
E3  2010 DATA 170,145,240,3,32,1
    22,145,32,186,140,32,186,140
    ,165,144,240,2122
4F  2020 DATA 24,169,45,160,148,
    32,52,131,32,237,148,32,147,
    148;201,63,1769
F2  2030 DATA 208,180,32,155,148
    ,96,76,198,146,96,0,169,32,3
    2,195,255,2018
56  2040 DATA 169,0,141,72,147,3
    2,151,155,96,169,10,32,195,2
    55,169,0,1793
30  2050 DATA 141,26,147,169,255
    ,32,56,149,173,74,112,141,71
    ,143,173,75,1937
EE  2060 DATA 112,141,72,143,32,
    151,155,96,0,162,2,189,151,1
    59,201,34,1800
1F  2070 DATA 208,1,232,160,0,14
    0,125,155,189,151,159,201,34
    ,240,15,201,2211
94  2080 DATA 13,240,11,153,131,
    155,238,125,155,232,200,76,8
    8,147,96,173,2233
45  2090 DATA 72,147,240,13,169,
    36,160,143,32,52,131,169,1,1
    41,42,129,1677
```

PROGRAM:BLOCK4

```
E2  10 REM CBM64 MACRO ASSEMBLER
     BASIC LOADER BY IAN GOFFE 1
    989 BLOCK4(37760-40959)
6C  20 PRINT"[CLR]":LI=100:FORA=
    37760TO40959STEP16
D7  30 C=0:FORE=ATOA+15:READL:C=
    C+L:POKEE,L:POKE53280,L
80  40 NEXTE:PRINT"[HOME]"LI
4F  50 READC1:IFC<>C1THENPRINT"E
    RROR IN LINE:"LI:END
D4  60 LI=LI+10:NEXTA
C8  70 PRINT"BLOCK 4 OK...":END
EF  100 DATA 96,32,246,151,32,23
    1,255,174,21,131,232,160,0,1
    40,125,155,2181
50  110 DATA 189,151,159,201,32,
    240,17,201,33,201,13,240,11,
    153,131,155,2127
E6  120 DATA 232,200,238,125,155
    ,76,144,147,172,125,155,162,
    0,189,131,155,2406
F3  130 DATA 32,174,148,232,136,
    208,246,169,13,32,174,148,17
    3,74,112,32,2103
45  140 DATA 174,148,173,75,112,
    32,174,148,169,255,32,174,14
    8,56,173,76,2119
0A  150 DATA 112,233,1,141,76,11
    2,176,3,206,77,112,173,125,1
    55,162,131,1995
B6  160 DATA 160,155,32,189,255,
    169,10,174,116,155,160,0,32,
    186,255,32,2080
D0  170 DATA 192,255,162,10,169,
    1,141,26,147,32,198,255,169,
    1,141,153,2052
0B  180 DATA 132,169,8,141,154,1
    32,173,170,145,240,3,32,122,
    145,32,186,1984
C7  190 DATA 140,32,186,140,165,
    144,240,20,169,45,160,148,32
    ,52,131,32,1836
9B  200 DATA 237,148,32,147,148,
    201,63,240,114,76,219,147,96
    ,13,70,73,2024
89  210 DATA 76,69,78,65,77,69,3
    2,73,83,32,78,79,84,32,80,82
    ,1089
B4  220 DATA 69,83,69,78,84,32,7
    9,78,32,67,85,82,82,69,78,84
    ,1151
1D  230 DATA 32,68,73,83,75,32,8
    0,76,69,65,83,69,32,73,78,83
    ,1071
0B  240 DATA 69,82,84,32,68,73,8
    3,75,32,67,79,78,84,65,73,78
    ,1122
E6  250 DATA 73,78,71,58,13,0,13
    ,73,78,83,69,82,84,32,70,73,
    950
FC  260 DATA 76,69,32,38,32,80,8
    2,69,83,83,32,65,32,75,69,89
    ,1006
B8  270 DATA 58,13,0,32,228,255,
    240,251,165,197,96,169,76,16
    0,143,32,2115
48  280 DATA 52,131,169,1,141,42
    ,129,32,41,147,32,27,147,96,
    141,74,1402
7C  290 DATA 143,140,75,143,173,
    76,112,133,63,173,77,112,133
    ,64,160,0,1777
6E  300 DATA 173,74,143,145,63,1
    72,75,143,238,76,112,208,3,2
    38,77,112,2052
40  310 DATA 173,76,112,205,73,1
    31,208,20,173,77,112,205,74,
    131,208,12,1990
9B  320 DATA 169,142,160,142,32,
    52,131,169,1,141,42,129,96,1
    62,0,189,1757
D0  330 DATA 131,155,236,125,155
    ,240,6,32,210,255,232,208,24
    2,96,0,0,2323
B0  340 DATA 162,0,142,254,148,1
    89,151,159,201,34,240,15,201
    ,13,240,17,2166
CE  350 DATA 201,33,240,24,32,56
    ,149,232,76,5,149,238,254,14
    8,76,20,1933
E8  360 DATA 149,169,13,32,56,14
    9,169,33,141,151,159,96,32,5
    6,149,232,1786
00  370 DATA 173,254,148,208,208
    ,76,33,149,172,74,112,132,63
    ,172,75,112,2161
11  380 DATA 132,64,160,0,145,63
    ,238,74,112,208,3,238,75,112
    ,173,74,1871
DF  390 DATA 112,205,69,131,208,
    20,173,75,112,205,70,131,208
    ,12,169,174,2074
F3  400 DATA 160,142,32,52,131,1
    69,1,141,42,129,96,173,255,1
    48,240,13,1924
F5  410 DATA 169,231,160,142,32,
    52,131,169,1,141,42,129,96,1
    74,21,131,1821
1D  420 DATA 232,160,0,140,125,1
    55,189,151,159,201,32,240,19
    ,201,13,240,2257
9A  430 DATA 15,201,33,240,11,15
    3,131,155,232,200,238,125,15
    5,76,134,149,2248
F1  440 DATA 202,142,246,150,162
    ,0,189,151,159,157,142,131,2
    01,13,240,4,2289
CD  450 DATA 232,76,166,149,169,
    2,141,255,148,238,245,112,17
    3,245,112,201,2664
7F  460 DATA 90,208,8,169,65,141
    ,245,112,238,244,112,174,71,
    131,172,72,2252
D5  470 DATA 131,134,63,132,64,1
    62,0,160,0,32,19,153,201,255
    ,240,84,1830
02  480 DATA 201,13,240,50,221,1
    31,155,208,15,230,63,208,2,2
    30,64,236,2267
8C  490 DATA 125,155,240,4,232,7
    6,215,149,32,19,153,201,13,2
    40,9,230,2093
FA  500 DATA 63,208,2,230,64,76,
    248,149,24,165,63,105,3,133,
    63,144,1740
BB  510 DATA 2,230,64,76,213,149
    ,236,125,155,208,221,230,63,
    208,2,230,2412
25  520 DATA 64,32,19,153,141,70
    ,150,230,63,208,2,230,64,32,
    19,153,1630
61  530 DATA 141,71,150,96,169,1
    ,141,42,129,169,84,160,132,3
    2,52,131,1700
CC  540 DATA 169,33,141,151,159,
    96,0,240,162,0,173,70,150,13
    3,63,173,1913
11  550 DATA 71,150,133,64,160,0
    ,32,19,153,201,255,240,30,20
    1,47,208,1964
92  560 DATA 3,76,130,150,157,15
    1,159,238,70,150,230,63,208,
    5,238,71,2099
5C  570 DATA 150,230,64,201,13,2
    40,10,232,76,84,150,169,1,14
    1,79,112,1952
1D  580 DATA 96,96,230,63,238,70
    ,150,208,5,230,64,238,71,150
    ,32,19,1960
13  590 DATA 153,230,63,238,70,1
    50,208,5,230,64,238,71,150,5
    6,233,48,2207
7C  600 DATA 141,245,150,172,246
    ,150,169,0,141,244,150,173,2
    45,150,240,44,2660
BE  610 DATA 185,142,131,201,44,
    240,23,201,13,240,4,200,76,1
    76,150,169,2195
4F  620 DATA 1,141,42,129,169,11
    7,160,132,32,52,131,76,123,1
    50,238,244,1937
E3  630 DATA 150,173,244,150,205
    ,245,150,208,226,76,221,150,
    200,200,185,142,2925
5D  640 DATA 131,201,13,240,12,2
    01,44,240,8,157,151,159,200,
    232,76,222,2287
4F  650 DATA 150,76,84,150,0,0,0
    ,162,2,160,8,134,63,132,64,1
    60,1345
10  660 DATA 0,177,63,208,46,200
    ,177,63,208,41,200,177,63,20
    8,36,24,1891
5B  670 DATA 165,63,105,3,133,63
    ,144,2,230,64,169,8,133,44,1
    69,1,1496
17  680 DATA 133,43,169,255,141,
    2,8,32,51,165,165,63,133,45,
    165,64,1634
77  690 DATA 133,46,96,230,63,20
    8,2,230,64,76,255,150,173,11
    6,155,170,2167
56  700 DATA 160,0,32,186,255,32
    ,121,155,173,125,155,162,131
    ,160,155,32,2034
```

```
23   710 DATA 189,255,165,45,233,
     2,170,165,46,233,0,168,169,0
     ,32,213,2085
9B   720 DATA 255,144,15,169,76,1
     60,143,32,52,131,169,1,141,4
     2,129,76,1735
5E   730 DATA 80,110,134,45,132,4
     6,32,51,165,169,1,141,61,152
     ,169,0,1488
A5   740 DATA 141,62,152,169,1,14
     1,63,152,32,114,152,76,80,11
     0,32,247,1724
43   750 DATA 150,76,80,110,169,2
     ,141,130,155,32,29,128,173,2
     1,128,141,1665
3A   760 DATA 61,152,173,22,128,1
     41,62,152,173,20,128,141,130
     ,155,238,130,2006
22   770 DATA 155,238,130,155,238
     ,130,155,32,29,128,173,21,12
     8,141,63,152,2068
D3   780 DATA 169,203,160,151,141
     ,2,3,140,3,3,96,173,0,2,240,
     63,1549
64   790 DATA 174,61,152,173,62,1
     52,32,28,152,134,198,189,0,2
     ,157,119,1785
F6   800 DATA 2,202,16,247,24,173
     ,61,152,109,63,152,141,61,15
     2,144,3,1702
30   810 DATA 238,62,152,76,131,1
     64,169,3,141,21,208,169,226,
     141,0,208,2109
3F   820 DATA 169,200,141,1,208,2
     38,40,208,141,2,208,141,3,20
     8,96,169,2173
1C   830 DATA 131,141,2,3,169,164
     ,141,3,3,108,2,3,134,99,133,
     98,1334
BA   840 DATA 162,144,56,32,73,18
     8,32,223,189,32,135,180,32,1
     66,182,162,1988
65   850 DATA 0,189,0,1,157,0,2,2
     40,3,232,208,245,96,16,39,5,
     1433
56   860 DATA 169,2,141,130,155,3
     2,29,128,173,21,128,141,61,1
     52,173,22,1657
AB   870 DATA 128,141,62,152,173,
     20,128,141,130,155,238,130,1
     55,238,130,155,2276
9B   880 DATA 238,130,155,32,29,1
     28,173,21,128,141,63,152,32,
     114,152,76,1764
0A   890 DATA 80,110,165,43,133,6
     3,165,44,133,64,160,0,177,63
     ,72,200,1672
7E   900 DATA 177,63,170,173,61,1
     52,200,145,63,173,62,152,200
     ,145,63,24,2023
A7   910 DATA 173,61,152,109,63,1
     52,141,61,152,144,3,238,62,1
     52,134,64,1861
E7   920 DATA 104,133,63,208,213,
     138,208,210,96,169,115,160,1
     43,32,52,131,2175
52   930 DATA 169,68,32,210,255,1
     69,79,32,210,255,169,83,32,2
     10,255,32,2260
A5   940 DATA 103,114,173,151,159
     ,201,88,208,3,76,80,110,138,
     162,151,160,2077
1B   950 DATA 159,32,189,255,169,
     15,174,116,155,160,15,32,186
     ,255,32,192,2136
3A   960 DATA 255,32,251,152,169,
     15,32,195,255,32,231,255,76,
     176,152,169,2447
33   970 DATA 15,174,116,155,168,
     32,186,255,32,192,255,162,15
     ,32,198,255,2242
BF   980 DATA 32,207,255,32,210,2
     55,201,13,208,246,169,15,32,
     195,255,96,2421
9B   990 DATA 76,176,152,120,169,
     44,133,1,177,63,141,74,143,1
     69,55,133,1826
21   1000 DATA 1,173,74,143,88,96
     ,169,162,160,153,32,52,131,1
     74,71,131,1810
57   1010 DATA 172,72,131,134,63,
     132,64,160,0,32,19,153,201,1
     3,240,16,1602
93   1020 DATA 201,255,240,38,32,
     182,145,230,63,208,2,230,64,
     76,55,153,2174
1A   1030 DATA 32,182,145,32,228,
     255,240,251,201,76,240,52,24
     ,165,63,105,2291
65   1040 DATA 3,133,63,144,2,230
     ,64,76,55,153,56,173,69,131,
     237,71,1660
EA   1050 DATA 143,141,160,153,17
     3,70,131,237,72,143,141,161,
     153,174,160,153,2365
84   1060 DATA 173,161,153,32,205
     ,189,169,147,160,153,32,52,1
     31,76,80,110,2023
48   1070 DATA 76,231,153,32,66,8
     9,84,69,83,32,70,82,69,69,46
     ,0,1251
BA   1080 DATA 0,0,13,77,65,67,82
     ,79,32,76,73,66,82,65,82,89,
     948
B1   1090 DATA 13,13,80,82,69,83,
     83,32,39,76,39,32,84,79,32,7
     6,912
43   1100 DATA 73,83,84,32,69,88,
     80,65,78,83,73,79,78,44,32,7
     9,1120
37   1110 DATA 82,32,65,78,89,32,
     75,69,89,32,84,79,32,67,79,7
     8,1062
09   1120 DATA 84,73,78,85,69,13,
     0,160,0,230,63,208,2,230,64,
     32,1391
83   1130 DATA 19,153,141,160,153
     ,200,32,19,153,133,64,173,16
     0,153,133,63,1909
CE   1140 DATA 160,0,32,19,153,20
     1,255,208,3,76,106,153,32,18
     2,145,230,1955
25   1150 DATA 63,208,2,230,64,76
     ,0,154,32,148,123,169,0,141,
     171,141,1722
C2   1160 DATA 162,0,189,153,159,
     157,142,131,201,13,240,13,23
     2,76,34,154,2056
C8   1170 DATA 165,197,201,63,208
     ,3,76,80,110,169,0,141,70,14
     3,32,1,1659
4C   1180 DATA 141,173,79,112,240
     ,3,76,80,110,174,70,143,160,
     0,185,142,1888
17   1190 DATA 131,201,13,240,23,
     189,151,159,201,13,240,46,21
     7,142,131,208,2305
F9   1200 DATA 5,232,200,76,78,15
     4,238,70,143,76,73,154,174,2
     48,112,173,2206
FB   1210 DATA 249,112,32,205,189
     ,169,32,32,182,145,162,0,189
     ,151,159,32,2040
A3   1220 DATA 182,145,201,13,240
     ,4,232,76,124,154,76,48,154,
     169,0,141,1959
30   1230 DATA 171,141,32,171,145
     ,169,20,160,155,32,52,131,17
     4,94,131,172,1950
16   1240 DATA 95,131,32,228,154,
     174,26,128,172,27,128,32,228
     ,154,173,72,1954
50   1250 DATA 112,240,25,169,71,
     160,155,32,52,131,174,96,131
     ,172,97,131,1948
11   1260 DATA 32,228,154,174,98,
     131,172,99,131,32,228,154,17
     3,73,112,240,2231
42   1270 DATA 16,169,93,160,155,
     32,52,131,174,179,120,172,18
     0,120,32,228,2013
46   1280 DATA 154,76,80,110,152,
     142,74,143,32,215,114,169,36
     ,32,210,255,1994
42   1290 DATA 173,77,113,32,210,
     255,173,78,113,32,210,255,17
     3,74,143,32,2143
24   1300 DATA 215,114,173,77,113
     ,32,210,255,173,78,113,32,21
     0,255,169,32,2251
ED   1310 DATA 32,210,255,96,13,4
     2,42,32,65,83,83,69,77,66,76
     ,89,1330
74   1320 DATA 32,67,79,77,80,76,
     69,84,69,32,45,32,78,79,32,6
     9,1000
A5   1330 DATA 82,82,79,82,83,32,
     42,42,13,13,79,66,74,69,67,8
     4,989
F5   1340 DATA 32,67,79,68,69,58,
     0,13,13,79,66,74,69,67,84,32
     ,870
44   1350 DATA 67,79,68,69,32,83,
     84,79,82,69,68,58,0,13,79,66
     ,996
E4   1360 DATA 74,69,67,84,32,69,
     88,69,67,85,84,69,83,32,70,8
     2,1124
A0   1370 DATA 79,77,58,0,8,0,160
     ,255,255,32,73,147,96,0,32,2
     19,1491
0C   1380 DATA 124,96,0,73,65,78,
     32,74,79,72,78,32,71,79,70,7
     0,1093
7C   1390 DATA 69,32,49,57,56,57,
     33,169,0,141,21,208,96,169,1
     ,162,1320
1D   1400 DATA 28,160,156,32,189,
     255,169,32,174,116,155,160,0
     ,32,186,255,2099
32   1410 DATA 32,192,255,162,32,
     32,198,255,32,207,255,32,207
     ,255,32,207,2385
B3   1420 DATA 255,32,207,255,32,
     207,255,170,32,207,255,32,20

44   1430 DATA 32,210,255,32,207,
     255,168,165,144,208,54,152,3
     2,210,255,32,2411
E7   1440 DATA 207,255,201,34,240
     ,5,32,210,255,208,244,32,210
     ,255,32,207,2627
01   1450 DATA 255,32,210,255,32,
     207,255,240,5,32,210,255,208
     ,246,169,13,2624
FE   1460 DATA 32,210,255,165,145
     ,201,127,240,8,201,239,240,2
     46,165,144,240,2858
C5   1470 DATA 173,169,32,32,195,
     255,32,231,255,76,80,110,36,
     32,121,155,1984
00   1480 DATA 173,125,155,162,13
     1,160,155,32,189,255,169,3,1
     74,116,155,160,2314
1C   1490 DATA 1,32,186,255,32,19
     2,255,162,3,32,201,255,169,0
     ,32,210,2017
85   1500 DATA 255,32,210,255,32,
     243,156,173,117,155,133,63,1
     73,118,155,133,2403
8F   1510 DATA 64,160,0,120,169,4
     4,133,1,177,63,162,55,134,1,
     32,210,1525
```

```
EA   1520 DATA 255,88,230,63,208,
     2,230,64,165,63,205,93,158,2
     08,226,165,2423
A2   1530 DATA 64,205,94,158,208,
     219,169,3,32,195,255,32,204,
     255,76,80,2249
6C   1540 DATA 110,238,130,155,23
     8,130,155,174,130,155,160,0,
     140,125,155,189,2384
E3   1550 DATA 151,159,201,34,240
     ,19,201,32,240,15,201,13,240
     ,11,153,131,2041
58   1560 DATA 155,232,200,238,12
     5,155,76,143,156,173,116,155
     ,174,116,155,160,2529
AD   1570 DATA 0,32,186,255,173,1
     25,155,162,131,160,155,32,18
     9,255,169,0,2179
4E   1580 DATA 174,119,155,172,12
     0,155,32,213,255,144,30,169,
     45,160,148,32,2123
96   1590 DATA 52,131,32,237,148,
     32,147,148,201,63,208,205,16
     9,76,160,143,2152
21   1600 DATA 32,52,131,169,1,14
     1,42,129,96,142,119,155,140,
     120,155,32,1656
EB   1610 DATA 219,124,96,160,0,1
     74,117,155,173,118,155,134,6
     3,133,64,169,2054
1E   1620 DATA 0,32,52,157,201,25
     5,240,14,201,1,240,21,201,2,
     240,17,1874
DC   1630 DATA 32,45,157,76,255,1
     56,165,63,141,93,158,165,64,
     141,94,158,1963
BA   1640 DATA 96,32,45,157,32,45
     ,157,32,45,157,76,255,156,23
     0,63,208,1786
FB   1650 DATA 2,230,64,96,120,16
     2,44,134,1,160,0,177,63,162,
     55,134,1604
4C   1660 DATA 1,88,96,169,84,160
     ,157,32,52,131,169,223,160,1
     57,32,52,1763
B2   1670 DATA 131,76,80,110,13,6
     5,45,65,83,83,69,77,66,76,69
     ,13,1121
62   1680 DATA 66,45,66,65,83,73,
     67,13,68,45,68,73,82,69,67,8
     4,1034
15   1690 DATA 79,82,89,13,69,45,
     69,86,65,76,85,65,84,69,32,6
     9,1077
9A   1700 DATA 88,80,82,69,83,83,
     73,79,78,13,70,45,70,73,78,6
     8,1132
FA   1710 DATA 32,83,84,82,73,78,
     71,13,71,45,71,79,84,79,32,6
     5,1042
9B   1720 DATA 68,68,82,69,83,83,
     13,72,45,72,69,76,80,13,73,4
     5,1011
87   1730 DATA 83,65,86,69,32,79,
     66,74,69,67,84,32,40,79,82,7
     1,1078
C9   1740 DATA 41,13,74,45,83,65,
     86,69,32,79,66,74,69,67,84,3
     2,979
3A   1750 DATA 40,76,79,65,68,41,
     13,76,45,76,73,83,84,13,0,77
     ,909
20   1760 DATA 45,77,65,67,82,79,
     32,76,73,66,82,65,82,89,13,7
     8,1071
3C   1770 DATA 45,65,80,80,69,78,
     68,13,79,45,79,76,68,13,81,4
     5,984
AF   1780 DATA 83,65,86,69,32,83,
     89,77,66,79,76,32,84,65,66,7
     6,1128
E2   1790 DATA 69,13,82,45,82,69,
     78,85,77,66,69,82,13,83,45,7
     6,1034
55   1800 DATA 73,83,84,32,70,82,
     79,77,32,68,73,83,75,13,85,4
     5,1054
CF   1810 DATA 65,85,84,79,13,88,
     45,83,65,86,69,32,77,47,67,1
     3,998
35   1820 DATA 89,45,83,89,77,66,
     79,76,32,84,65,66,76,69,13,9
     0,1099
E3   1830 DATA 45,68,79,83,32,83,
     85,80,80,79,82,84,0,0,0,173,
     1053
9F   1840 DATA 116,155,170,160,1,
     32,186,255,32,121,155,173,12
     5,155,162,131,2129
58   1850 DATA 160,155,32,189,255
     ,173,94,131,133,63,173,95,13
     1,133,64,174,2155
65   1860 DATA 26,128,172,27,128,
     169,63,32,216,255,76,80,110,
     173,116,155,1926
39   1870 DATA 170,160,1,32,186,2
     55,32,121,155,173,125,155,16
     2,131,160,155,2173
0B   1880 DATA 32,189,255,173,96,
     131,133,63,173,97,131,133,64
     ,174,98,131,2073
59   1890 DATA 172,99,131,169,63,
     32,216,255,76,80,110,169,45,
     160,159,32,1968
A7   1900 DATA 52,131,32,103,114,
     169,0,141,130,155,32,29,128,
     173,21,128,1538
5E   1910 DATA 141,83,159,173,22,
     128,141,84,159,169,59,160,15
     9,32,52,131,1852
AF   1920 DATA 32,103,114,169,0,1
     41,130,155,32,29,128,169,71,
     160,159,32,1624
17   1930 DATA 52,131,32,103,114,
     162,0,189,151,159,157,131,15
     5,201,13,240,1990
ED   1940 DATA 3,232,208,243,138,
     162,131,160,155,32,189,255,1
     73,116,155,170,2522
3D   1950 DATA 160,1,32,186,255,1
     73,83,159,133,63,173,84,159,
     133,64,174,2032
76   1960 DATA 21,128,172,22,128,
     169,63,32,216,255,76,80,110,
     13,83,84,1652
19   1970 DATA 65,82,84,32,65,68,
     68,82,63,13,0,13,69,78,68,32
     ,882
48   1980 DATA 65,68,68,82,63,13,
     0,13,70,73,76,69,78,65,77,69
     ,949
93   1990 DATA 63,13,0,0,0,169,10
     6,160,159,141,24,3,140,25,3,
     32,1038
2B   2000 DATA 68,229,169,71,160,
     111,32,52,131,96,72,138,72,1
     52,72,169,1794
0B   2010 DATA 140,160,159,32,30,
     171,169,19,141,119,2,169,13,
     141,120,2,1587
56   2020 DATA 169,2,133,198,104,
     168,104,170,104,76,71,254,14
     7,83,89,83,1955
E2   2030 DATA 32,50,56,50,49,53,
     0,32,32,32,32,32,32,32,32,32
     ,578
58   2040 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
FF   2050 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
01   2060 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
8B   2070 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
9D   2080 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
A7   2090 DATA 32,32,32,32,32,32,
     32,32,32,32,32,32,32,32,32,3
     2,512
```

```
PROGRAM:MACRODEMO

16   10 ! A SIMPLE DEMONSTRATION
     OF MACROS IN     ACTION.
2A   11 !
DF   12 OUT 3
2C   13 !
3A   14 ! DEFINE MACROS INTO CURR
     ENT MACRO LIBRARY
2E   15 !
16   16 +CLS
FB   17 +PRINTAT
E8   18 +COLOUR
32   19 !
E1   20 *=$C000
34   21 !
BF   22 START !
36   23 !
01   24 ! INVOKE THE MACROS
38   25 !
24   26 @CLS
BD   27 @COLOUR 0,3,3
A3   28 @PRINTAT 10,10,"TEXT TO B
     E PRINTED"
3C   29 !
F3   30 RTS
AE   31 RUN START ! SET EXECUTION
      ADDRESS
01   32 !
B2   33 ! ONCE ASSEMBLED USE 'G'
     TO RUN THE OBJECT CODE
```

Give your Expert Cartridge a boost with this handy routine

By R. Drummond

MEMORY RESTORER

Attention *Expert* Cartridge users!

Have you ever tried to back-up a program, only to find half way through loading it, the computer suddenly resets or crashes?

Here is the solution to this aggravating problem: *Memory Restorer.*

How To Use

Program the *Expert* as normal and type 'N' to reset. Load *Memory Restorer* by typing:

LOAD "MEMORY RESTORER"
(add ,8 for disk)

and then RUN it.

When instructed switch off the *Expert* and press reset. Now load the program to be copied, switch on the *Expert*, press RESTORE (press ESM if light is lit), and save as normal (type 'Z "program name").

How It Works

The 'N' command in the *Expert* clears the whole memory so that its compactor is as efficient as possible. Unfortunately, some programs detect this change and cease loading. This problem can be overcome by restoring the memory to its original power-up state (alternate 32 byte blocks of 255 and 0).

How To Enter

Switch the computer on and off (or enter *Expert* and type 'N'), and then enter this line:

POKE 44,16 : POKE 4096,0 : NEW

This raises the bottom of the Basic memory, so that the restorer can be poked in below it.

Now type in the Basic loader entitled 'restorer base' and RUN it. Correct any errors, and RUN it again.

When it is finished, you will be asked which device you wish the program to be saved to. Press '1' for tape or '2' for disk.

Well, that's it. The Restorer should enable you to load some previously unLOADable programs, but it still does not guarantee success in freezing.

If you have any problems or suggestions to make, please contact me through *Your Commodore,* or MBX me on *Compunet.* **(RCD1).**

```
PROGRAM:CONFIGURE

7D  10 REM *** MACRO ASSEMBLER B
    ASIC CONFIGURE IAN GOFFE 198
    9 ***
60  20 INPUT "SAVE ASSEMBLER TO
    WHICH DEVICE";DEV
8A  30 DIM A$(8),V(8),V1(8),V2(8
    )
1D  40 RESTORE:FOR L=1TO8:READA$
    (L),V(L),V1(L):V2(L)=PEEK(V(
    L))
98  50 IF V1(L)=1THENV2(L)=PEEK(
    V(L))+256*PEEK(V(L)+1)
92  60 NEXT L
7F  70 POKE53280,0:POKE53281,0
A1  80 PRINT "[CLR,C7,SU,SD38,SI
    ]";
D1  90 PRINT "[SG,C8]MACRO ASSEM
    BLER V1.4 CONFIGURE PROGRAM[
    C7,SB]";
10  100 PRINT "[SJ,SF38,SK]"
FC  110 PRINT "[C7,SU,SD38,SI]";

71  120 PRINT "[SG,C5,SPC6]WRITT
    EN BY IAN GOFFE 1989[SPC5,C7
    ] [SB]";
D2  130 PRINT "[SJ,SF38,SK]"
36  140 PRINT"[SPC3]FUNCTION[SPC
    11]ADDRESS  VALUE"
71  150 FOR L=1 TO 8:PRINT "[YEL
    LOW]";L;"[WHITE]";A$(L),"[C8
    ] ("V(L);"=";V2(L);")":NEXT
40  160 PRINT"[DOWN,C7] 9 SAVE C
    ONFIGURED ASSEMBLER"
84  170 GET K$
38  180 IF K$<"1" OR K$>"9"THEN
    170
7C  190 IFK$="9" THEN 310
BC  200 PRINT "[DOWN,C8]ENTER NE
    W VALUE FOR [WHITE]";A$(VAL(
    K$))
20  210 INPUT W
21  220 L=VAL(K$)
C3  230 IF W>255 AND V1(L)=0 THE
    N PRINT "MUST BE 8 BIT":FORL
    =1TO1000:NEXT:GOTO 40
5C  240 IF V1(L)=0THENPOKEV(L),W
    :GOTO 40
64  250 B=INT(W/256):A=W-(256*B)

DC  260 POKEV(L),A:POKEV(L)+1,B:
    GOTO 40
0B  270 DATASYMBOLS START,39797,
    1,SYMBOLS LIMIT,33601,1
77  280 DATAMACRO DIR. START,336
    07,1,MACRO DIR. LIMIT,33609,
    1
ED  290 DATAMACRO LIB. START,336
    03,1,MACRO LIB. LIMIT,33605,
    1
E7  300 DATASTORAGE DEVICE,39796
    ,0,SYMBOL OUTPUT,33081,0
E0  310 INPUT "[DOWN,WHITE]FILEN
    AME";F$
DE  320 PRINT"[CLR]POKE43,0:POKE
    44,110:POKE45,0:POKE46,160"
EB  330 PRINT:PRINT:PRINT"SAVE";
    CHR$(34);F$;CHR$(34);",";DEV

4D  340 POKE631,19:POKE632,13:PO
    KE633,13:POKE198,3
```

PROGRAM: RESTORER BASE

```
D1   10 A=2049:B=36:C=100
B2   20 FORD=0TOB:E=0:FORF=0TO7:R
     EADG
16   30 IFG<0ORG>255THENPRINT"ERR
     OR IN LINE";C+(D*10):END
BF   40 POKEA+(D*8)+F,G:E=E+G:NEX
     TF
38   50 READG:IFG<>ETHENPRINT"ERR
     OR IN LINE";C+(D*10)
02   60 NEXTD
40   100 DATA 16,8,196,7,158,50,4
     8,54,537
4D   110 DATA 54,58,82,67,68,49,0
     ,0,378
C9   120 DATA 0,169,11,141,32,208
     ,141,33,735
EF   130 DATA 208,169,15,141,134,
     2,169,23,861
08   140 DATA 141,24,208,169,128,
     141,145,2,958
F5   150 DATA 32,68,229,160,0,185
     ,182,8,864
F4   160 DATA 153,0,4,200,192,34,
     208,245,1036
12   170 DATA 160,0,185,73,8,153,
     52,3,634
46   180 DATA 200,192,112,208,245
     ,76,52,3,1088
97   190 DATA 120,169,0,133,1,169
     ,0,133,725
FE   200 DATA 251,169,8,133,252,1
     62,248,160,1383
14   210 DATA 127,169,0,145,251,1
     36,192,63,1083
B5   220 DATA 208,249,169,255,145
     ,251,136,16,1429
D5   230 DATA 251,165,251,24,105,
     128,133,251,1308
80   240 DATA 165,252,105,0,133,2
     52,202,208,1317
E4   250 DATA 222,165,252,201,132
     ,240,214,168,1595
9A   260 DATA 55,133,1,160,0,185,
     128,3,665
78   270 DATA 153,80,4,200,192,32
     ,208,245,1114
2F   280 DATA 76,124,3,0,84,21,18
     ,14,340
75   290 DATA 32,69,24,16,5,18,20
     ,32,216
A1   300 DATA 79,70,70,46,32,80,1
     8,5,400
0A   310 DATA 19,19,32,82,5,19,5,
     20,201
63   320 DATA 46,32,32,32,0,69,24
     ,16,251
F8   330 DATA 5,18,20,32,77,5,13,
     15,185
51   340 DATA 18,25,32,82,5,19,20
     ,15,216
6F   350 DATA 18,5,18,32,45,32,82
     ,67,299
87   360 DATA 68,49,32,49,57,56,5
     6,32,399
7A   370 DATA 0,0,0,0,0,0,0,32,32

0A   380 DATA 228,255,201,49,240,
     9,201,50,1233
E2   390 DATA 208,245,162,8,76,24
     2,8,162,1111
53   400 DATA 1,169,1,160,0,32,18
     6,255,804
79   410 DATA 169,15,162,19,160,9
     ,32,189,755
31   420 DATA 255,169,1,133,251,1
     69,8,133,1119
B5   430 DATA 252,169,251,162,218
     ,160,8,76,1296
6A   440 DATA 216,255,77,69,77,79
     ,82,89,944
D9   450 DATA 32,82,69,83,84,79,8
     2,69,580
22   460 DATA 82,0,0,0,0,0,0,0,82

80   500 PRINT"[CLR]PRESS '1' TO
     SAVE RESTORER TO TAPE,"
01   510 PRINT"[SPC3]OR '2' TO SA
     VE TO DISK."
19   520 SYS2272
```

LOADERBUILDER

Create your own Basic loaders without effort for all those data statements

By J. Kinley

It's well past midnight, the masterpiece of machine code programming you've devoted many hours of your life to writing is finally bug-free and running beautifully. Filled with a longing to share your creation with your fellow man, you survey your arsenal of machine code development aids – editors, assemblers, loaders and the rest. If only you had an easy way of turning your work back into a nice, simple Basic loader that other users could type in...

Loaderbuild is just the utility you've been looking for. This program will take machine code (or any other numerical data) stored in the memory of your C64, and turn it into a Basic loader. This has a list of potential applications. Maybe you want to submit your code to a magazine for publication? A *Loaderbuild* loader is an ideal form of presentation. Your code will be turned into DATA statements, with a checksum for each line, as an aid to anyone typing the loader into their own machine. You could also make use of *Loaderbuild* to share your programs with a friend who lacks your own development facilities. Perhaps you could use it just to keep your work in an easily accessible form. For whatever reasons, most machine code programmers should find *Loaderbuild* a useful addition to their collection of utilities.

The listing of the "DEMO" program is an example of a loader constructed by *Loaderbuild*. The start address for the machine code is automatically inserted into line 140, and the number of DATA lines calculated and entered into line 150.

The machine code data in question is then written into DATA statements, starting from line 200, with 16 items to each line. If necessary, the last DATA line is made up to full length with zeros. Every DATA statement is given a checksum as a guard against typing errors if the loader is keyed into another computer.

If you want to try "DEMO" out, enter it into your C64 then RUN it. There will be a brief pause while the DATA items are POKEd into memory, in this case from location 49152 onwards. Now use SYS 49152 to run the machine code. OK, not very exciting, but serves to demonstrate the idea!

Using Loaderbuild

Loaderbuild is written in Basic. No problem if your machine code is in a 'safe' area of the computer (such as above location 49152). However, if your code is in an area normally used by Basic, then don't forget to reset top or bottom of Basic as necessary before letting *Loaderbuild* loose in your machine.

In case you don't know how, the limits of the Basic area are set using the following POKEs:-

POKE 51, (bottom of BASIC, low byte)
POKE 52, (bottom of BASIC, high byte)
POKE 55, (top of BASIC, low byte)
POKE 56, (top of BASIC, high byte)

If you make any adjustments, follow them with a CLR to get the computer used to the idea.

Now load 'LOADERBUILD' and RUN it.

The program will ask you to input start and finish addresses for the code to be worked on. You can enter this information in either decimal, or in hex (preceded with the customary $ sign).

Next tell the program the name under which the new loader is to be stored on disk – and that's it, the computer does the rest.

To use your loader, reset top and bottom of Basic if necessary (see above), then simply LOAD it from disk, where it will have been saved under the name you gave it, and RUN in the usual way.

How Loaderbuild Works

Lines 1000-2210

The input section for start and finish addresses, and loader name. Calls subroutines at line 6000 to check against invalid entries, and 7000 to handle any input errors.

Lines 3000-3300

Sets up the Basic lines of the loader and writes them to disk. Inserts start address into loader, and calculated number of DATA lines. Note variables KL and KH. These are pointers to the start of the next line in Basic, and must be calculated for each line. The actual Basic lines are in coded DATA statements, starting from line 10000. Repeated calls are made to subroutines at 8000 (which finishes construction of each Basic line and numbers it), and 9000 (which writes a Basic line to disk).

Lines 4000-4090

Compiles DATA statements, 16 items to a line. Fills last line with zeros as necessary. Calls subroutine at 5000, which finishes construction of the Basic DATA statement.

Lines 5000-5090

See 4000-4090. Calls subroutine at 9000 to write BASIC line to disk.

Lines 6000-6260

Checks start and finish addresses for following conditions:-

Illegal characters
Entry too long
Invalid memory location

Also converts hex entries into decimal.

Lines 7000-7080

Prints error message and waits for a key to be pressed before continuing.

Lines 8000-8150 & Lines 9000-9050

See lines 300-3300

Lines 10000-10150

DATA statements containing BASIC lines. All keywords are in tokenised form, flagged with # sign.

PROGRAM:LOADERBUILD

```
64  1000 REM********************
    ************
73  1010 REM** LOADERBUILD
         **
70  1020 REM**
         **
13  1030 REM** BY JB KINLEY  198
    9        **
5B  1040 REM********************
    ************
91  1050 REM
58  2000 REM********************
    ************
91  2010 REM** INPUT DETAILS OF
    PROGRAM   **
90  2020 REM** TO BE PROCESSED
         **
3A  2030 REM********************
    ************
C6  2040 POKE 53280,0 : POKE 532
    81,0
BB  2050 PRINT "[CLR,WHITE,REV S
    N,DOWN] CONVERT MACHINE CODE
     TO BASIC LOADER"
8D  2060 PRINT " ---------------
    --------------------"
62  2070 PRINT "[PURPLE,DOWN5,RI
    GHT31]-----[UP2]"
2F  2080 INPUT "START ADDRESS OF
    M/C PROGRAM[SPC8,LEFT7,CYAN
    ]";IN$
C5  2090 GOSUB6000
59  2100 IFER$<>""THEN GOSUB7000
    :GOTO2070
C8  2110 CE=IN:MS$=STR$(IN):IN$=
    ""
8A  2120 PRINT "[GREEN,DOWN5,RIG
    HT31]-----[UP2]"
92  2130 INPUT "END ADDRESS OF M
    /C PROGRAM[SPC10,LEFT7,CYAN]
    ";IN$
6F  2140 GOSUB6000
AB  2150 IFER$<>""THEN GOSUB7000
    :GOTO2120
41  2160 ME=IN:ME$=STR$(IN)
33  2170 IFME<CETHENER$="END ADD
    RESS LOWER THAN START ADDRES
    S":GOSUB7000:RUN
1D  2180 PRINT "[RED,DOWN7,RIGHT
    19]----------------[UP4]"
2C  2190 PRINT "PROGRAM NAME FOR
     BASIC LOADER"
D3  2200 INPUT "[DOWN,RIGHT18]<[
    SPC17,LEFT19,CYAN]";PN$
25  2210 REM
4C  3000 REM********************
    ************
45  3010 REM** SET UP LOADER PRO
    GRAM LINES**
68  3020 REM** IN OUTPUT FILE
         **
2E  3030 REM********************
    ************
87  3040 KL=1 : KH=8 :REM ** LIN
    K TO NEXT LINE
6E  3050 LL=90 : LH=0 :REM ** LI
    NE NUMBER
F7  3060 OPEN 2,8,2,PN$+",P,W"
FB  3070 PRINT#2,CHR$(KL);CHR$(K
    H);
CF  3080 GOSUB 8000: GOSUB 9000
BB  3090 GOSUB 8000
E5  3100 LN$=LEFT$(LN$,LEN(LN$)-
    1)+PN$+CHR$(0)
60  3110 KL=KL+LEN(PN$): IF KL>2
    55 THEN KL=KL-256 : KH=KH+1
    : REM **SET LINE LINK
58  3120 GOSUB 9000
9D  3130 GOSUB 8000: GOSUB 9000
0B  3140 GOSUB 8000: GOSUB 9000
5F  3150 GOSUB8000
51  3160 LN$=LEFT$(LN$,LEN(LN$)-
    1)+MS$+CHR$(0)
5C  3170 KL=KL+LEN(MS$): IF KL>2
    55 THEN KL=KL-256 : KH=KH+1
    : REM **SET LINE LINK
7E  3180 GOSUB9000
97  3190 GOSUB8000
04  3200 ND=VAL(ME$)-VAL(MS$)+1
ED  3210 NL=INT((ND+15)/16)-1
97  3220 NL$=STR$(NL)
3A  3230 NL$=RIGHT$(NL$,LEN(NL$)
    -1)
F9  3240 LN$=LEFT$(LN$,LEN(LN$)-
    1)+NL$+CHR$(0)
D4  3250 KL=KL+LEN(NL$): IF KL>2
    55 THEN KL=KL-256 : KH=KH+1
    : REM **SET LINE LINK
4E  3260 GOSUB9000
20  3270 FORR=1TO4
49  3280 GOSUB8000: GOSUB9000
64  3290 NEXT
7F  3300 REM
20  4000 REM********************
    ************
E8  4010 REM** COMPILE DATA LINE
    S          **
4C  4020 REM********************
    ************
0B  4030 DE=1:CS=0
37  4040 LL=LL+10 : IF LL>255 TH
    EN LL=LL-256 : LH=LH+1 : REM
     **INCREMENT LINE #
D5  4050 LN$=""
79  4060 BY=PEEK(CE):CS=CS+BY:BY
    $=STR$(BY)
F6  4070 BY$=RIGHT$(BY$,LEN(BY$)
    -1)
80  4080 LN$=LN$+BY$+","
EF  4090 CE=CE+1:IFCE>METHEN4130
0D  4100 DE=DE+1:IFDE<17THEN4060
18  4110 GOSUB5000
28  4120 GOTO4030
83  4130 DE=DE+1
8A  4140 IFDE>16THENGOSUB5000:GO
    TO4170
82  4150 LN$=LN$+"0,"
5F  4160 GOTO4130
47  4170 PRINT#2,CHR$(0);CHR$(0)
    :CLOSE2
E4  4180 END
E1  4190 REM
14  5000 REM********************
    ************
C2  5010 REM**COMPILE BASIC DATA
     STATEMENT**
20  5020 REM********************
    ************
BE  5030 CS$=STR$(CS)
5F  5040 CS$=RIGHT$(CS$,LEN(CS$)
    -1)
46  5050 LN$=CHR$(LL)+CHR$(LH)+C
    HR$(131)+LN$+CS$+CHR$(0)
23  5060 DL=LEN(LN$)+2
B9  5070 KL=KL+DL : IF KL>255 TH
    EN KL=KL-256 : KH=KH+1 : REM
     **SET LINE LINK
EF  5080 GOSUB9000
7B  5090 RETURN
08  6000 REM********************
    ************
B9  6010 REM** INPUT VALIDATION
         **
14  6020 REM********************
    ************
0F  6030 IN=0:ER$=""
AE  6040 IFLEN(IN$)>5THENER$="EN
    TRY TOO LONG":GOTO6260
68  6050 IFLEFT$(IN$,1)="$"THEN6
    130
6B  6060 IN=VAL(IN$)
80  6070 FORT=1TOLEN(IN$)
BD  6080 IFMID$(IN$,T,1)<"0"ORMI
    D$(IN$,T,1)>"9"THENF=1
63  6090 NEXT
F7  6100 IFF=1THENER$="INVALID C
    HARACTERS IN ENTRY":F=0
02  6110 IFIN>65535THENER$="MEMO
    RY LOCATION OUT OF BOUNDS"
E4  6120 GOTO6260
9F  6130 SL=LEN(IN$)-1
62  6140 IN$=RIGHT$(IN$,SL)
65  6150 FORT=1TOSL
1E  6160 TS$=MID$(IN$,T,1)
1E  6170 IF(TS$>="0"ANDTS$<="9")
    OR(TS$>="A"ANDTS$<="F")THEN6
    190
EB  6180 ER$="INVALID CHARACTERS
     IN ENTRY"
41  6190 NEXT:IFER$<>""THEN6260
94  6200 FORT=0TOSL-1
01  6210 CV$=MID$(IN$,SL,1):SL=S
    L-1
91  6220 IFCV$>="0"ORCV$<="9"THE
    NCV=VAL(CV$)
52  6230 IFCV$>="A"ANDCV$<="F"TH
    ENCV=ASC(CV$)-55
5C  6240 IN=IN+CV*16^T
00  6250 NEXT
02  6260 RETURN
FC  7000 REM********************
    ************
C1  7010 REM** INPUT ERROR HANDL
    ING          **
08  7020 REM********************
    ************
16  7030 PRINT"[DOWN3,RED]"ER$
F4  7040 PRINT"[DOWN2,C3,SPC7]PR
    ESS ANY KEY TO CONTINUE"
D8  7050 GETXX$:IFXX$=""THEN7050
CB  7060 PRINT"[UP,SPC35]"
55  7070 PRINT"[UP4,SPC35,UP9]"
4D  7080 RETURN
D0  8000 REM********************
    ************
BD  8010 REM** ADD STRING DATA T
    O PROGRAM **
FC  8020 REM********************
    ************
A1  8030 LL=LL+10 : IF LL>255 TH
    EN LL=LL-256 : LH=LH+1 : REM
     **INCREMENT LINE #
EF  8040 LN$=""
97  8050 READ DA$
C7  8060 IF DA$="#"THEN8110
B4  8070 IF LEFT$(DA$,1)<>"#"THE
    N8100
CE  8080 DA=VAL(RIGHT$(DA$,LEN(D
    A$)-1))
91  8090 DA$=CHR$(DA)
84  8100 LN$=LN$+DA$:GOTO8050
C7  8110 LN$=CHR$(LL)+CHR$(LH)+L
    N$+CHR$(0)
23  8120 DL=LEN(LN$)+2
B9  8130 KL=KL+DL : IF KL>255 TH
    EN KL=KL-256 : KH=KH+1 : REM
     **SET LINE LINK
65  8140 RETURN
7A  8150 REM
C4  9000 REM********************
    ************
F2  9010 REM** WRITE LINE TO PRO
    GRAM FILE **
D0  9020 REM********************
    ************
F6  9030 PRINT#2,CHR$(KL);CHR$(K
    H);LN$;
FD  9040 RETURN
```

C64 PROGRAMMING

```
F2  9050 REM
92  10000 REM********************
    *************
01  10010 REM** DATA AREA
              **
EE  10020 REM********************
    *************
5E  10030 DATA "#143"," ** BASIC
     LOADER FOR PROGRAM","#"
78  10040 DATA "#143"," ** ","#"

52  10050 DATA "#143"," ** COMPI
    LED USING 'LOADERBUILD' UTIL
    ITY","#"
68  10060 DATA "#143"," ** BY J
    KINLEY[SPC3]1989","#"
0F  10070 DATA "S","#178","#"
DF  10080 DATA "#129","L","#178"
    ,"0","#164","#"
FF  10090 DATA "C","#178","O:","
    #129","D","#178","O","#164",
    "15","#"
33  10100 DATA "#135","A:C","#17
    8","C","#170","A:","#151","S
    ","#170","L","#172"
D5  10110 DATA "16","#170","D,A:
    ","#130","#"
B6  10120 DATA "#135","A:","#139
    ","A","#179","#177","C","#16
    7","#153"
CF  10130 DATA "#34","CHECKSUM E
    RROR IN LINE ","#34",";200",
    "#170","L","#172"
30  10140 DATA "10:","#144","#"
54  10150 DATA "#130","#"
```

```
PROGRAM:DEMO

6B  100 REM ** BASIC LOADER FOR
    PROGRAM
06  110 REM ** DEMO
FB  120 REM ** COMPILED USING 'L
    OADERBUILD' UTILITY
95  130 REM ** BY J KINLEY   198
    9
6A  140 S= 49152
DB  150 FORL=0TO6
20  160 C=0:FORD=0TO15
CD  170 READA:C=C+A:POKES+L*16+D
    ,A:NEXT
9D  180 READA:IFA<>CTHENPRINT"CH
    ECKSUM ERROR IN LINE ";200+L
    *10:STOP
3C  190 NEXT
C1  200 DATA160,0,185,35,192,240
    ,7,200,32,210,255,76,2,192,3
    2,228,2046
56  210 DATA255,201,0,240,249,20
    1,42,240,9,238,32,208,238,33
    ,208,76,2470
CC  220 DATA14,192,96,80,82,69,8
    3,83,32,65,32,75,69,89,32,84
    ,1177
0A  230 DATA79,32,67,72,65,78,71
    ,69,13,66,79,82,68,69,82,32,
    1024
D6  240 DATA65,78,68,32,83,67,82
    ,69,69,78,32,67,79,76,79,85,
    1109
F1  250 DATA82,83,13,13,13,80,82
    ,69,83,83,32,42,32,84,79,32,
    902
FB  260 DATA69,88,73,84,0,0,0,0,
    0,0,0,0,0,0,0,0,314
```

SCREEN SAVER

Give your Monitor/T.V. Screen a rest with Screen Saver

By G. Gornu

How long does your computer system remain switched on and unattended during a programming session? Probably long enough to gradually wear down the C.R.T. (Cathode Ray Tube) in your monitor.

During all this time the poor CRT is getting sunburnt by the electron gun! One solution is to switch off the monitor during such intervals. This is not recommended due to the current surges occuring at each switching on or off which could corrupt your program.

Here is a "soft" solution. It is a simple interrupt driven routine devised to limit the damage. It will "black" the screen if the keyboard is ignored for about one minute.

How It Works

Every 1/50th of a second the program checks if a key has been pressed. If not, it decrements a counter, if the counter has run down to zero then it saves the border colour, sets it to black, and "switches off" the screen. This is done by turning off bit 4 location $D011 (53265), which changes the whole screen to the border colour.

The next time a key is pressed, the same bit is turned back on, which restores the screen. The saved value of the border colour is restored too, and the counter is reset to its starting value, calculated for a delay of approximately one minute.

The routine occupies memory from $CFAA (53162) to $CFFF (53247).

To Use It

Type in *Screen Saver,* and save it before attempting to run it because it will destroy itself once the machine code is poked in memory.

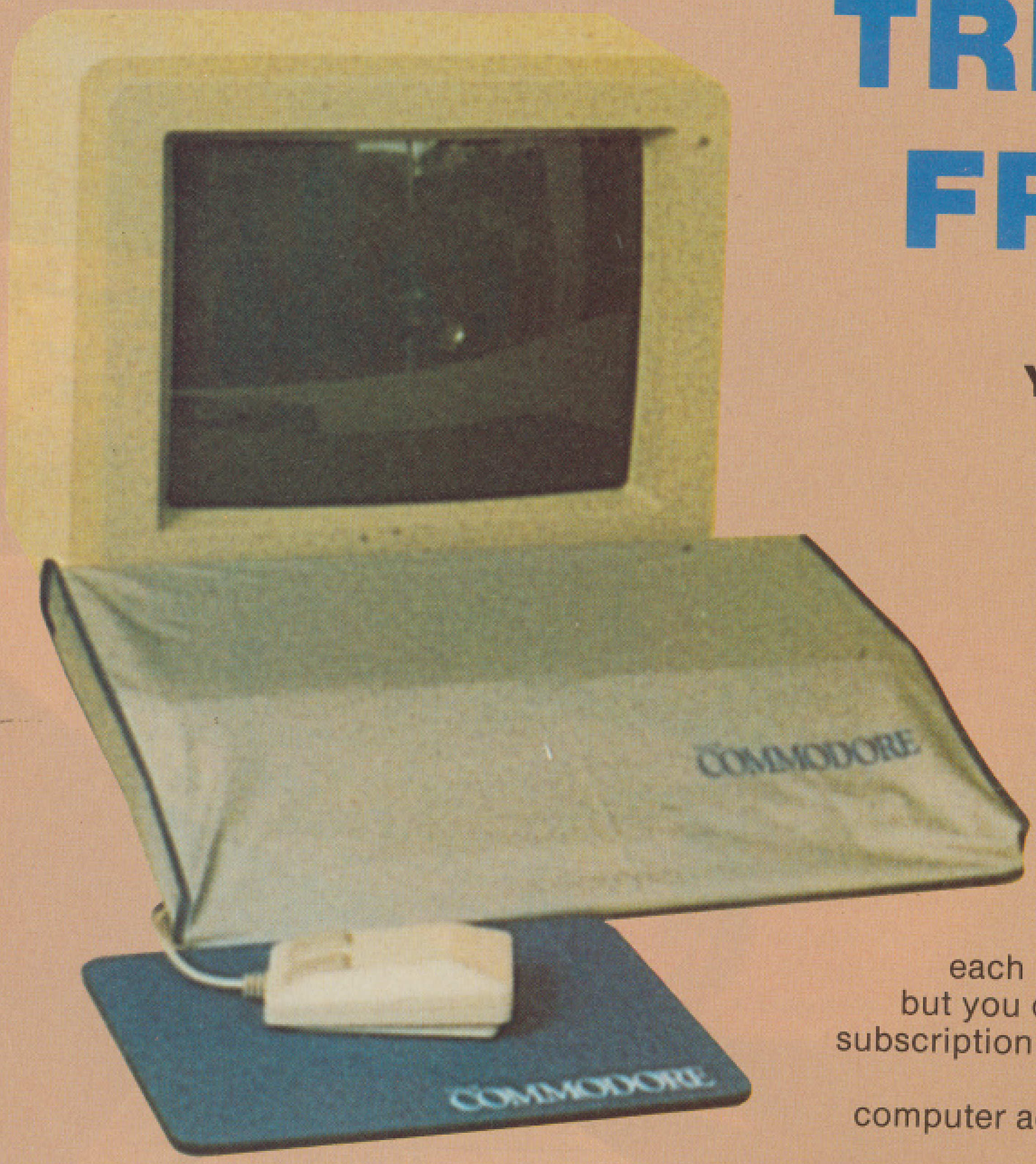
Before starting programming, or loading a program, load "screen saver" and run it. There is one little drawback, the border colour can't be changed once the routine is operating. Also note that "Screen Saver" will not work with any program which changes the interrupt vector at $0314. Pressing RUN-STOP/RESTORE will disable the routine. To restart: SYS 53162.

```
PROGRAM:SCREEN SAVER

CB  100 REM    ********************
    **********
D5  110 REM    *
               *
70  120 REM    *         SCREEN SAVE
    R          *
C8  130 REM    *             BY
               *
09  140 REM    *         GERARD CORN
    U          *
3D  150 REM    *
               *
0F  160 REM    ********************
    **********
25  170 REM
32  180 PRINTCHR$(147);:AD=53162
    :FORI=ADTO53247
F2  190 READA:CS=CS+A:POKEI,A:PR
    INT".";:NEXT
AB  200 IFCS<>11716THENPRINT"DAT
    A ERROR.":END
F9  210 SYSAD:PRINT"SCREEN SAVER
      INSTALLED."
7E  220 NEW
49  230 DATA120,169,189,160,207,
    141,020,003
56  240 DATA140,021,003,088,173,
    032,208,141
11  250 DATA255,207,096,165,197,
    041,064,240
13  260 DATA032,206,253,207,208,
    024,206,254
F9  270 DATA207,208,019,173,032,
    208,141,255
95  280 DATA207,169,000,141,032,
    208,173,017
65  290 DATA208,041,239,141,017,
    208,076,049
5C  300 DATA234,173,017,208,009,
    016,141,017
A7  310 DATA208,173,255,207,141,
    032,208,169
FA  320 DATA015,141,254,207,169,
    000,141,253
84  330 DATA207,240,227,000,015,
    000
```


© Columbia Pictures

TREAT YOURSELF... TREAT A FRIEND!



Subscribe to YOUR COMMODORE and receive a FREE keyboard dust cover and mouse-mat worth a total of £10.70!

That's right if you take out a years subscription to YOUR COMMODORE for either yourself or for a friend, not only will we make sure its delivered to you each month at no extra charge*, but you or the recipient of your gift subscription will also receive these two stylish Your Commodore computer accessories absolutely free!

Just fill in the coupon below and send it to the address given with a cheque, money order or credit card instructions to cover the cost of the subscription. We'll do the rest.

Subscription Rates:

UK	**£15.60**
Europe	**£23.25**
Middle East	**£23.50**
Far East	**£26.40**
Rest of The World	**£24.00**

Airmail Rates on Request

* Overseas Subscriptions include postage.

This offer closes on Friday 1st December 1989 and is also open to current YOUR COMMODORE subscribers who wish to renew or extend their current subscription but must do so using the order form provided.

Please allow 28 days for delivery of your gift. To guarantee receipt of gift subscription before Christmas, orders **MUST** be received by the closing date.

PLEASE TICK

☐ I would like to subscribe to YOUR COMMODORE and receive a free gift.

☐ I would like to send a YOUR COMMODORE gift subscription and free gift.

MY NAME .... RECIPIENT'S NAME ....

ADDRESS .... ADDRESS ....

....

....................POSTCODE ....POSTCODE ....

☐ New Subscriber ☐ Renewal ☐ New Subscriber ☐ Renewal

Please commence the subscription(s) with the .... issue. I enclose my cheque/money order for £.......... payable to A.S.P. or debit my Access/Visa Account.

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ Valid from .... to ....

Signature .... Date .... return this order form and remittance to:

The Subscription Manager (YC/2), Argus Specialist Publications, Argus House, Boundary Way, Hemel Hempstead, Herts, HP2 7ST.



Heroes of the Lance

HACKATAK

Welcome to the radical new tips section, where you can find the latest games mapped, poked and pulled to bits by me, your tipsmaster, Kirky Baby. You may notice that some of the games featured in these pages are a wee bit old, but as I write the PC Show is only two days. Fear not folks I'll be getting the latest software and hacking it to pieces to next month's Hackatak will be BIG!!!

Samurai Warrior

Having trouble with your bunnies? Simply type HHDSFHHH on the high score table for infinite energy. Wow!

Captain America

La la la la la la America. If you want extra lives for this slightly (!) disappointing conversion keep pressing the bottom (Ooer!) button on the control panel and you'll receive another captain.

Renegade III

Get to level two and then kill yourself (or rather the renegade). When you have lost all your lives, you will be asked to rewind the tape. Just press the space and level three will load. Well I never!

Rambo III

Yet another cheat (I'm too good to you lot). Type

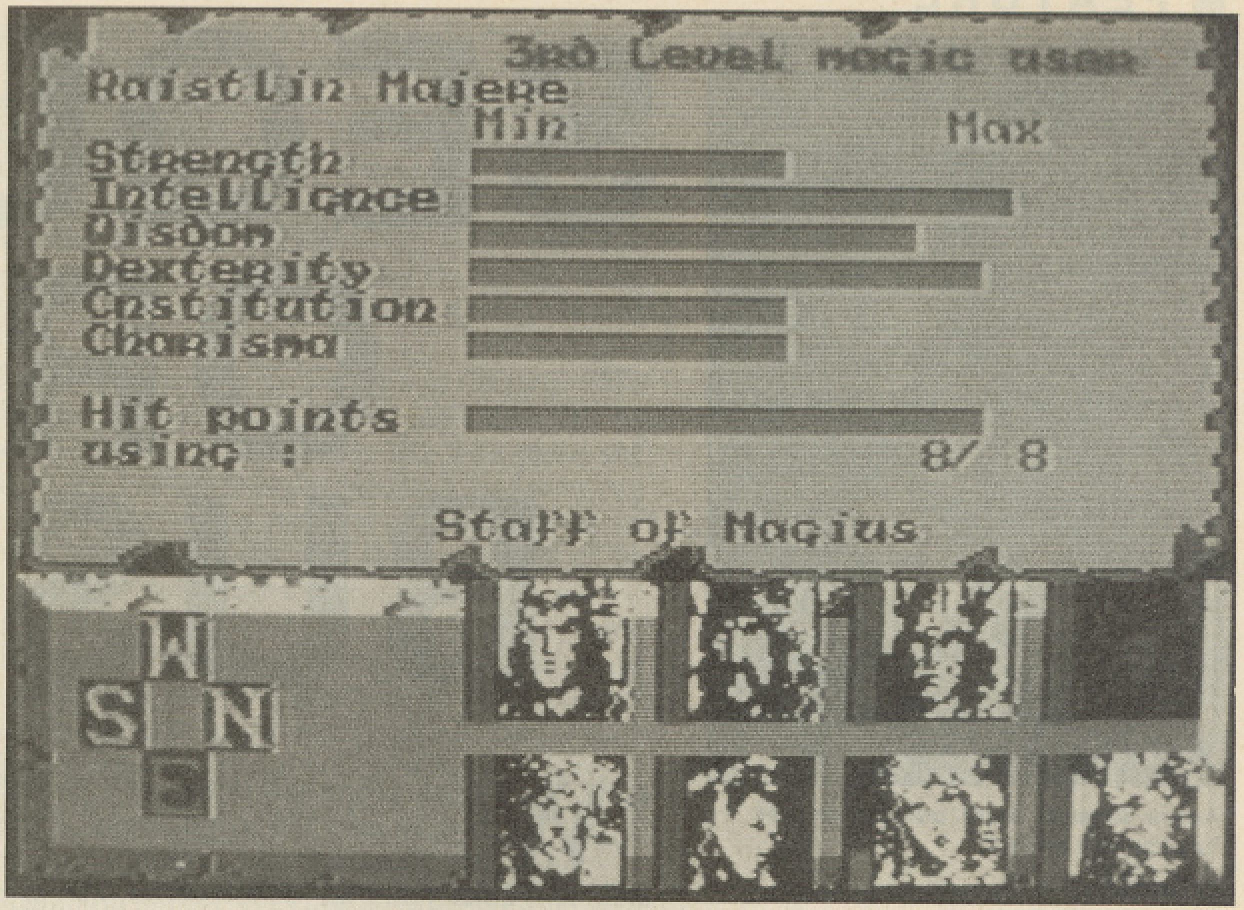
RENEGADE on the highscore table, press 1, 2 or 3 to start on any of the three levels.

Dragon Ninja

When you lose all your lives on the forth level, ignore the 'rewind tape' message, leave the tape playing and level five will load. You will have five lives and full time. Da naa!

Heroes of the Lance

Yes, this is a wee bit old, but as yet no other magazine has printed a complete solution, until now! Just follow the directions given, using the game's on screen compass.



Above: With all those characters I think we'll have a party!

LEVEL 1
First, enter door (south). Walk south until you reach the scroll. Enter door (east). Walk east. Enter door (north). Walk north. Enter door (west). Walk west. Enter door (north). Walk south. Enter door (west). Enter second door (west). Take scroll then leave (north). Go back to first door and enter (west). Walk west and take the gold. Walk east. Enter door (north). Walk south and enter the round hole in the wall (west).

LEVEL 2
Walk east. Enter door (south). Walk south. Enter door (east). Walk south. Tall off the gems and potions. Walk south. Take shield. Walk north. Enter door (west). Walk south. Enter door (west). This should take you to the waterfall and cure all your wounds. Walk south. Jump gap. Walk south. Take gold cup. Walk south. Enter second door (west).

LEVEL 3
Walk south. Go past door. Walk south. Take potion. Walk north. Enter door (west). Walk south. Take shields. Enter door (west). Walk north. Enter door (west). Walk north. Enter door (west).

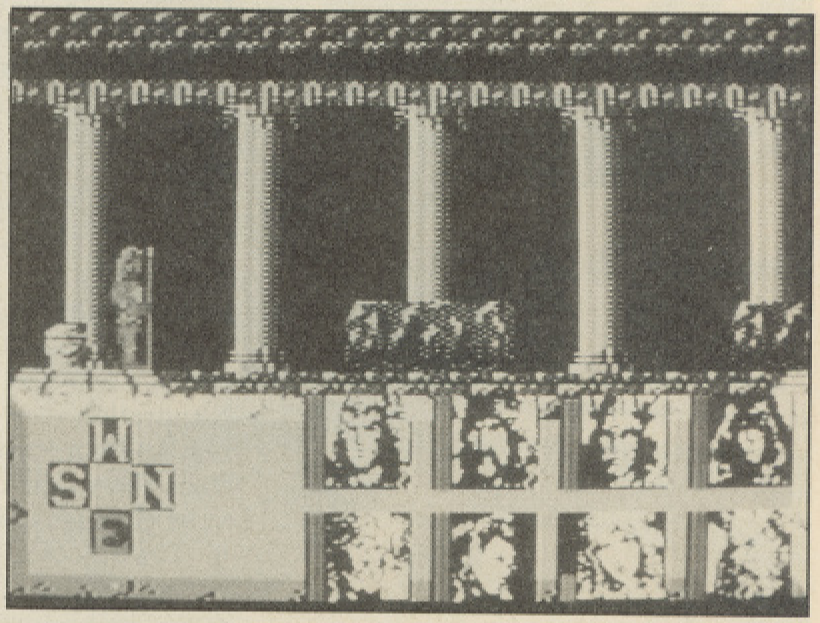
LEVEL 4
Jump gap. (Hint, try over stepping the mark!). Walk west. Enter door (south). Walk north. This is a very hard screen, select Tasslehoff Burrfoot. (Hint, when the arrows start to fly jump to get by). When you have passed the fire enter the door (south). Walk south. Enter door (east). Walk east. Enter door (north). Walk north. Enter door (west). Walk south. Take gold and silver cups. Take four potions. Take scroll. Walk north. Enter door (west). Walk west. Take rings. Use rings. Walk east. Enter door (south). Enter door (east). Walk south. Enter door (west). Walk west. Enter door (south). Walk south. Enter door (west). Save the game here. Select Riverwind. Now jump the gaps, again, try over stepping the mark. When you have jumped all the gaps enter the door (east).

LEVEL 5
Walk east. Enter door (north). Walk south. Enter door (east). Take coins. Walk west. Enter door (north). Walk south. Enter door east. Walk east. Enter door (south). Enter 4th door. Walk east. Enter door (north). Walk south. Enter door (east). Walk east. Enter door (north). Enter door (east). Walk east. Take potion. Walk east. Enter door (north). Walk north. Enter east. Walk east. Keep your eyes open for a round hole in the wall this is the entrance to LEVEL 6.

The Dragon's Lair
As soon as you enter the lair hit the space bar. Select Goldmoon, and return to the game. You can only kill the dragon by throwing the Staff at him. Just hold down the fire button and push the joystick diagonally up. When you have disposed of him run left avoding the falling rocks and take the Disc's to finish the game.

Sorry people, that's all we have time for. Next month, when the PC Show is well and truly over, I'll have LOADSATIPS, so tune in for an action packed HACKATAK next month, or you may regret it, not now but soon and for the rest of your life!

Kirk Rutter



Above: Go east, go east. CHOMP! Er... go west, go west.



Above: Amanda Barry, put your clothes back on this instant!

SEQUEL OR BUST!

'Who ya gonna call *this* time?"; "*Now* who ya gonna call?"; "They're here to save the world *again*"; "They're back to save the world"; the possibilities of crummy by-lines are seemingly endless. Yes, after five quiet years the Ghostbusters, heroes of the world's biggest-grossing comedy ever, are back. But for Columbia Pictures, eager for a box-office success to mop up the worry left by a string of flops, it hasn't been easy...

In 1982 Ivan Reitman (currently one of Hollywood's hottest comedy properties after success such as 'Legal Eagles', 'Screwballs', 'Stripes', 'Animal House' and 'Twins') pulled together 'Saturday Night Live' star Bill Murray, 'Blues Brothers' maestro Dan Aykroyd, talented actor/writer/director/producer Harold Ramis and Academy Award darling Sigourney 'Alien(s)' Weaver for a big-budget film comedy about four psychic investigators who start a rather jolly exorcism business, Ghostbusters Inc. The film, which cost twenty million dollars to make, went on to gross $220 million, pretty much guaranteeing a sequel in one form or another, particularly in the light of Hollywood's current obsession with Roman numerals ('Friday 13th Part IX', 'A Nightmare on Elm Street VI', 'Batman II', 'Blade Runner II' (being filmed on the 'Batman' set), 'Alien IV' (with Arnold Schwarzeneggar and Sigourney Weaver already signed), 'Spaceballs III: The Search for Spaceballs II' and 'Star Wars I: The Clone Wars' are all in the pipeline). However after the worldwide furore of the first picture's success had died down, everything went quiet. Ex-Columbia Pictures head David Puttnam showed a noted lack of enthusiasm for 'Ghostbusters II', even to the point of considering making it with an all-new low-budget cast. Puttnam's much-publicised enmity with star Bill Murray, the leader of the Ghostbusters, obviously didn't help, and it wasn't until late 1987, when Puttnam was deposed as studio boss, that 'Ghostbusters II' cropped up again. Puttnam's replacement, a Hollywood power player named Dawn Steel, recalls it as "one of the first things we talked about" at her interview for the corporation's presidency. Not surprising, since it was obviously crucial to the ailing studio that the movie got made. Six flops in one year (1988) – including the anticipated smash success 'Punchline' (with Tom Hanks and 'Sally Field'), which grossed only $21 million – left Columbia Pictures with a lot of problems, both in financial terms and in the box-office credibility stakes.

Despite the usual sure-fire success of sequels to big movies, the sheer volume of genre movies on the Summer market might just have left "Ghostbusters II' comfortably profitable but not, ultimately, a massive hit. Studio boss Steel called the movie "the most important sequel in the history of Columbia Pictures" and it's easy to see why. It was a predictable but necessary evil for the corporation; one requiring a big investment and, therefore, a big risk. The film had got to be made. The formula had to be repeated. The cast and crew from the original movie had to be involved. But how were they all going to be got together?

The story of how it happened begins much like the plot of 'Ghostbusters II' itself, in which the protagonists of the original have left 'busting behind and gone back to some semblance of normal life. The same was true of most of the cast and crew from 'Ghostbusters'; Murray had appeared in several

dismal films (including 'Scrooged' in 1987) and had subsequently dropped out of sight; Aykroyd's 'Spies Like Us', 'Doctor Detroit', 'Dragnet' and 'The Couch Trip' were all awful; Remis had written, directed and/or appeared in several teen movies, with some success; director Ivan Reitman was filming Schwarzenegger and DeVito (tipped to be Penguin in 'Batman II') in 'Twins'; female lead Weaver was enjoying critical success herself, earning Oscar nominations for 'Aliens', 'Gorillas in the Mist' and 'Working Girl'. The man who brought them all together was none other than Michael Ovitx, 'the King of Hollywood' (actually head of the famous Creative Artists Agency of Los Angeles).

What happened at their lunchtime meeting in Jimmy's (a Beverly Hills showbiiz restaurant) was the first step towards making 'Ghostbusters II'. As Murray recalls, 'Walking into the meeting no-one really felt we's make the movie. But in the course of lunch we had so many laughs and so much fun that it became clear we'd really enjoy working together again." A year of deal-making later, the sequel was rolling with virtually the entire cast of its predecessor, even down to the 'Busters' long-suffering (ex)-secretary (played by Annie Potts) and accountant-cum-attorney (Rick Moranis). The delectable Sigourney Weaver reprises her role as Dane, Bill Murray's on-off girlfriend in the first movie, since when Dana has married, had a child and divorced and actually gets the group 'busting ghosts again when strange things start happening to her baby boy, Oscar. She admits to being "a bit bewildered" by her comedian co-stars, saying "It's like being put in a class with awful boys, who spend all their time throwing spitballs and dunking your braids into the inkwell. It's a streak of masochism for me. I just find it wonderful."

The film is being shot on a $30 million budget, kept low by Murray, Aykroyd, Ramis and Reitman working for a profit-share wage rather than their customary up-front fee, an idea suggested by Reitman after testing it with Schwarzenegger and DeVito on 'Twins'. Dawn Steel is quoted as saying that 'Ghostbusters II' could have cost "close to $50 million" had the stars taken their wages in advance. "We'd much rather pay a piece of the profits than huge salaries," she says. "That way we're saying 'take the risk with us. Then we're partners.'" Risk? Surely a sequel to a $220 million movie isn't risky? "It's pretty scary," Steel demurs, "because the Summer is so jammed with product." Indeed, 'Batman', 'Star Trek V' and 'Indiana Jones and the Last Crusade' were all vying for a piece of 'Ghostbusters II's audience.

Ms Steel and the others involved in the film needn't have worried, as it turned out. 'Ghostbusters II' opened to a phenomenal audience reaction, smashing all the box-office reconds 'Indy III' had broken mere weeks before ('Batman' and 'Lethal Weapon 2' were to bust the records again only weeks later...) At the time of writing, nearly three months before it opens on this



Above: You shoudln't pee into an electric urinal.



Above: "Just blow into this, Mr Painting – Bad guy.

Below: Ho, ho, ho, and a steaming ghost trap!





Right: "Are you sure we need all this protective gear to swim in the North Sea?"



side of the pond, 'Ghostbusters II' has earned a cool $100 million (which, statistics fans, is *half* the entire take of 'Ghostbusters' in *one twentieth* of the time), despite lukewarm reviews everywhere. Aykroyd and Ramis would again write the script, giving themselves the unenviable task of bringing the 'busters back with a fresh story. "None of us had ever done a sequel," Ramis says, "although we'd had offers on virtually every film we'd worked on. But then we started thinking if we could come up with a concept that seemed worthy, that really progressed us in some way, that had something new to say, then we'd do it." Aykryod and Ramis, along with Reitman, "played with many different permutations of what happened to the Ghostbusters after the first movie, and we finally settled on something that would seem meaningful for all of us, and that's what we pursued."

The film opens with the four 'busters gone bust (sic), having been made to pay for the mess they made in the first movie. Peter Venkman (Murray) is hosting a psychic-phenomena cable-TV show called 'Wow! People'; Ray Stantz (Aykroyd) and Winston Zeddemore (Ernie Hudson) are reliving their Ghostbusting days at childrens' birthday parties; Ego Spengler (Remis) has

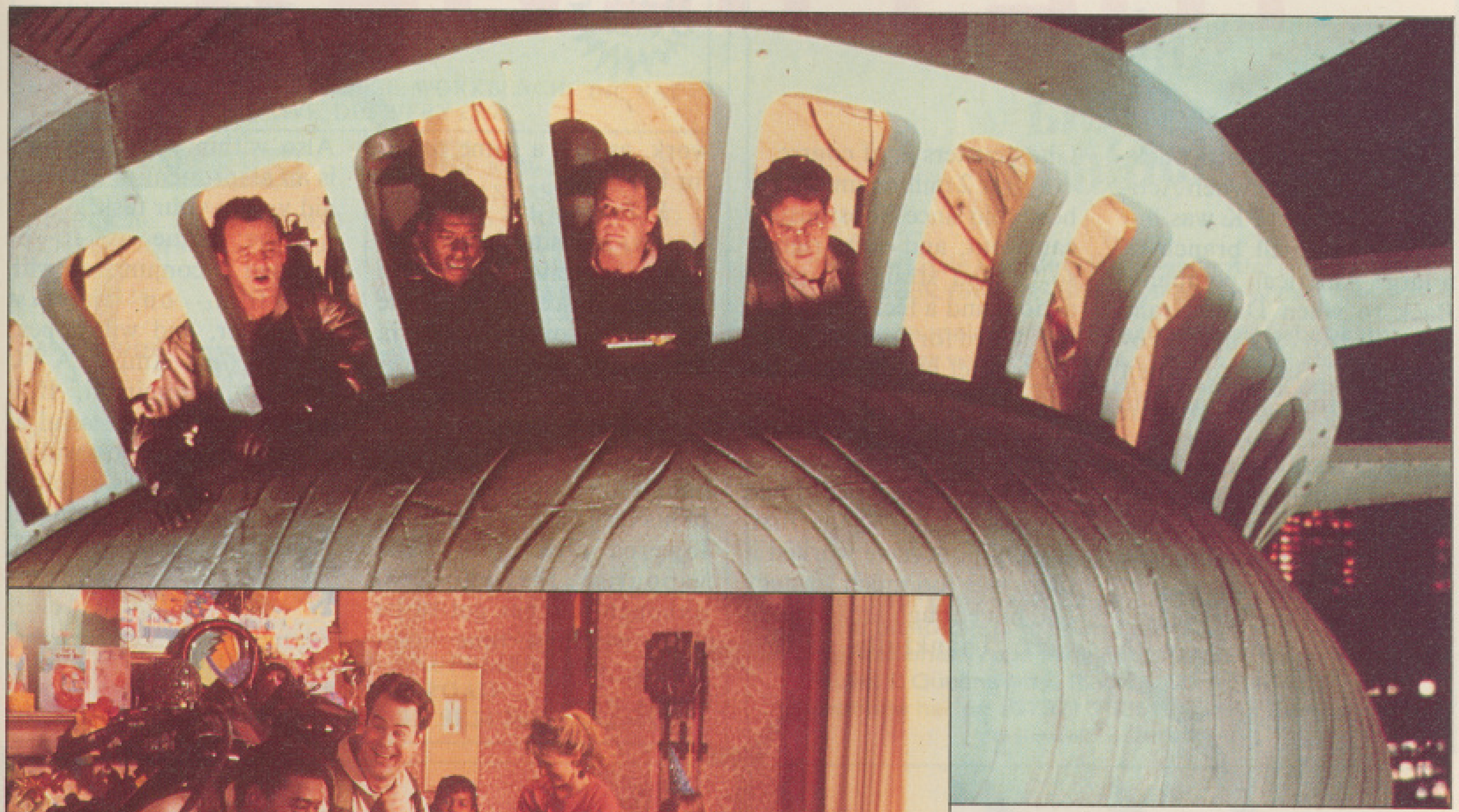






Right: "Do you always do it this way?" "No, I sometimes wear wellies!"

buried himself into his work, obsessed with his research into the effect of human behaviour on ectoplasmic slime. The script drags them back together for a battle against slime and spirits revived by negative human behaviour. To beat the spooks this time the team have to convince everyone in New York that they have to be nice to each other for forty-eight hours, otherwise the sticky stuff will take over the city. "The moral issue was important to us," says Ramis. The final showdown takes place at – where else? – the Statue of Liberty, with 'Star Wars' effects wizards Industrial Light & Magic returning to provide the film with the ghosts and ghouls. Visual effects supervisor Dennis





Above: Get ahead of the statue of Liberty.

Muren was asked, among other things, to come up with a river of slime and spooks that were "interesting! In addition to being vaporous and flying around, the ghosts can change their shape easily as they move with a lot of what we call 'squash and' stretch." Sounds fun.

Yup, the Ghostbusters are back. A clever new symbol, some wicked-looking new proton packs, a brilliant theme song by Bobby Brown, every bit as catchy as Ray Parker Jr.'s 1984 smash title song, a slinky new dress for Ms. Weaver, a souped-up new Ectomobile (the Ghostbusters' Cadillac-ambulance private transport) with dozens of roof-lights and new computerised signboards, 100,000 gallons of slime, plus a gengeful villain in the form of Slimer all ad up to make 'Ghostbusters II' every bit as much fun as the first picture. And there is no reason to suspect that this outing for the dynamic quattro will be the last, for I'll bet that 'Ghostbusters II' will go on to make even more money than 'Ghostbusters'. Shares in Columbia Pictures will be rocketing again, and plastic proton packs will be appearing in toy stores all over, sending the merchandise manufacturers' dividends up as well.

So, who ya gonna call? Your stockbroker.

GHOSTBUSTERS II

THE PREVIEW

Let us drift back. Back to when Activision UK was but a small branch of a large American company. Back to when Dave Crane was a top leisure programmer. Back to when Ghostbusting was all the craze.

Five years later, Columbia and Activision have done it again, but how can either of them hope to top the biggest grossing comedy of all time, and the best selling computer game? With Ghostbusters 2, of course.

Over 2 million units have been sold since Ghostbusters came out, and quite rightly so. It had strategy, arcade action, and a feel of urgency just added for good luck. But the market has changed, the consumers are now younger, and the computers have grown up. Ghostbusters 2 would not have worked had it been similar to the first. It would not have worked if there was too much strategy and not enough arcade qualities. Thankfully it does work, as it is a game suited for the 1990s.

It follows the film plot closely, focusing in particular on the section where Dan Akroyd descends into the bowls of an overrun city, via the sewers. Along the sewer walls are several nasties that try to slime, slice, and dice him, although he is well endowed with a photon pack of his very own. Whilst being lowered down you must vapourise the ghoulies, although this has got to be done wtihin a time limit. Also within your backpack is an assortment of extras to aid you in your task.

The game is to be released in conjunction with the film, on the 1st December, and will appear on C64, and Amiga. A PC version is imminent. If it proves half as successful as its predecessor, hats will be flying in the Activision office (what say we're looking at the Christmas number one?)



Large Stiff Cardboard Compo

To celebrate the launch of Ghostbusters 2, Activision are giving away a rather unique prize.

If you've ever been to the cinema and have drolled over the large cardboard 3D cutouts that advertise movies, have no far, YC's here!

You can win the Ghostbusters 2 version of a cutout, which stands over 3 foot tall, if you answer these simple questions...

1. What is the name of Bill Murray's character in the movie?
a) Peter Venkman
b) Paul Plonkman
c) Cecil Parkinson

2. What is the name of the green, slimey ghost featured in both films?
a) Blatter
b) Slimer
c) Harvey Proctor

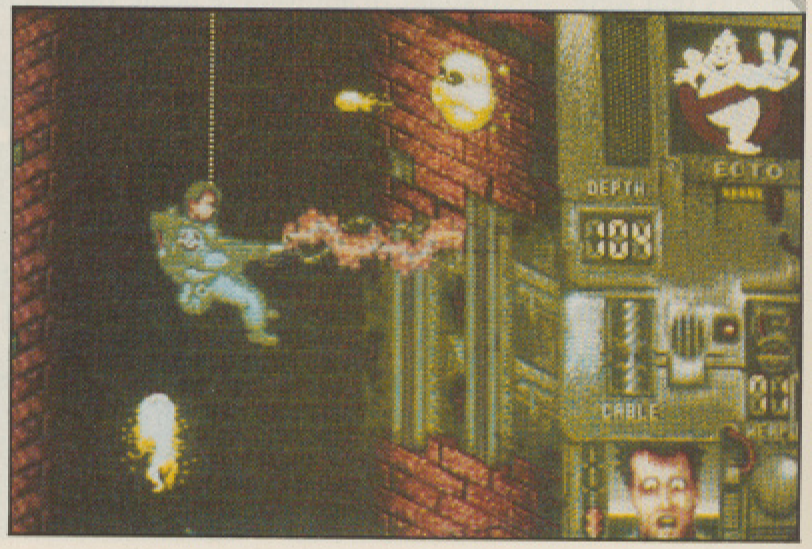
3. Who directed both films?
a) Stephen Spielberg
b) Ivan Reitman
c) Jeffery Archer

Send your entries on the back of a postcard (or sealed envelope) to:

Who ya gonna call compo, YC, Argus House, Boundary Way, Hemel Hempstead, HP2 7ST.

The closing date is 31st December 1989, and the first correct entry pulled out of the ectoplasm on that date will receive the cutout.

(Ab)normal Compo Rules Apply!



C64 AMIGA C128

NEW LOWER PRICE

1541 CII DISK DRIVE £139.00 £3.50 p&p

5 1/4 DISK DRIVE FOR THE C64
NEW STYLE SLIMLINE CASE + P.S.U.

AMIGA 500

ONLY £379 INC VAT

★ FREE PHOTON PAINT
★ FREE TV MODULATOR
★ FREE 10 STAR GAMES PACK
U.K. VERSION INCLUDES MOUSE, WORKBENCH 1-3 BUILT IN DISK DRIVE, DELIVERY £5.00

PRINTERS

STAR LC10...........£159.00
CITIZEN HQP40......£360.00
PANASONIC KX-P1124..........£299.00

100% ERROR FREE **DISKS**

10x3.5" DSDD..........£9.50
10x5.25" DSDD.........£4.50
50 DISK BOX 5.25".....£5.99
100 DISK BOX 5.25".....£6.99
25 DISK BOX 3.5"......£4.95
MOUSE HOLDER......£4.50
MOUSE MAT..........£4.50

C64c

NEW FOR XMAS
'LIGHT FANTASTIC PACK INCLUDES - LIGHT GUN 3D GAMES, PAINT PACKAGE, DATA RECORDER, GAMES **£140.00 + £5.00 P&P**

C64c HOLLYWOOD PACK INCLUDES DATA RECORDER, JOYSTICK, 5 QUIZ GAMES + 5 MOVIE GAMES. **£140.00 + £5.00 P&P**

C64 DATA RECORDER £24.50
C64 POWER SUPPLY £19.95
JOYSTICK KONIX S'KING..............£9.50
CARRIAGE £1.50 SMALL ITEMS

C.M.S CROFTON MICRO SUPPLIES 45 WHITBREAD ROAD BROCKLEY LONDON SE24 2BD **01-469 3246**

THINKING OF BUYING A NEW CAR?

DON'T!

........without consulting the

"Handy Little Booklet"

"Handy Little Booklet" is the essential reference book for everyone buying a new car.

It lists the main car manufacturers alphabetically, together with each car's current retail price, insurance group, engine size, urban mpg, unleaded compatibility, Service/Maintenance/Repair costs - based on 50,000 mileage - and tax bracket - for company car drivers.

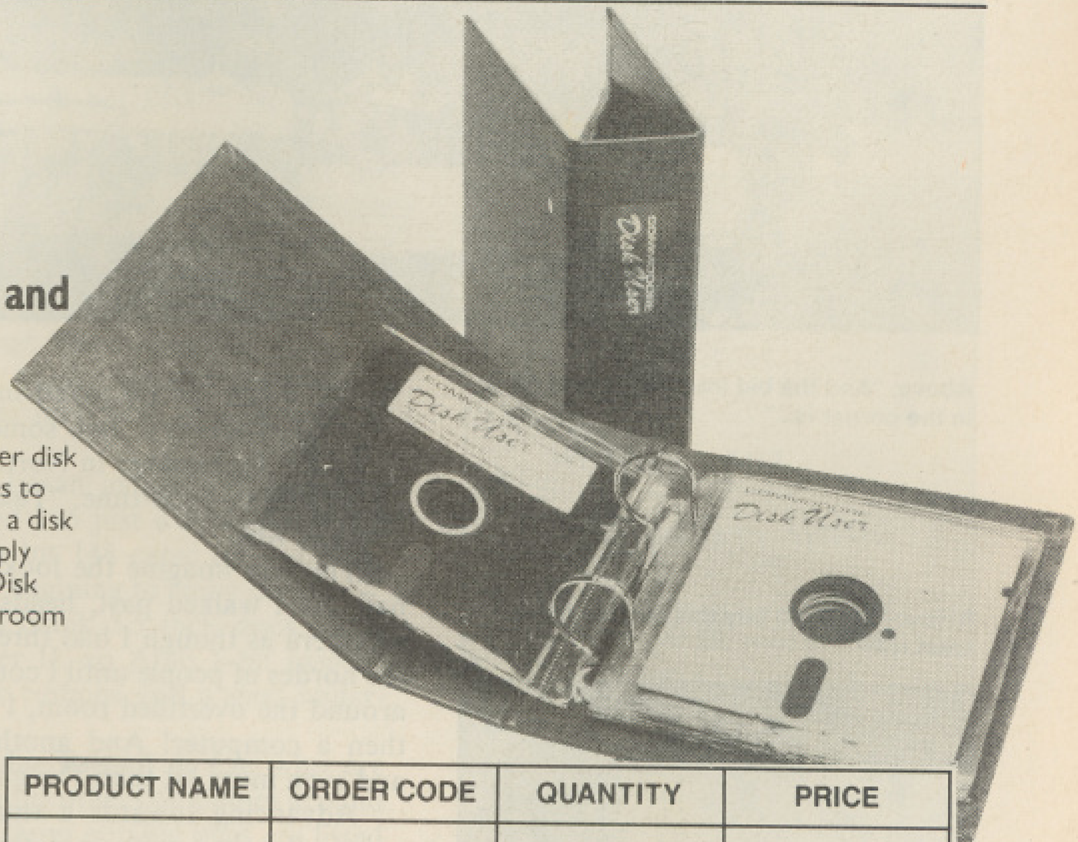
So before you invest thousands of pounds in a new car invest just £2 in the **"Handy Little Booklet"** to help you make the right choice.

To get your copy send £2 plus 25 pence (for postage and packaging) to: Kim Cleary, Company Car, International Trade Publications Ltd., Queensway House, 2 Queensway, Redhill, Surrey RH1 1QS, or telephone her on (0737) 768611 for further details.

Registered no: 2246951

Binders

Organise and protect your disk with Commodore Disk User disk binders and data disks.



Why not keep your Commodore Disk User program collection alongside your magazines in a stylish Disk User disk binder? The binder comes complete with 10 disk sleeves to organise and protect your program disks. Why not buy a disk binder to house all of your data disks? We can even supply Commodore Disk User data disks. The Commodore Disk User logo immediately identifies your disks and there's room to title them and document the disks details.
Send for your disks and binders now!

Prices are as follows:

Commodore Disk User Binder £4.95, including 10 sleeves. Order code **BDYU1**

Commodore Disk User Binder with 10 sleeves and 10 disks, £9.95 Order code **BDYU2**

10 sleeves for insertion in binder, £1.50. Order code **BDS10**

20 sleeves for inclusion in binder, £2.75. Order code **BDS20**

10 Commodore Disk User data disks, £5.95. Order code **BDD10**

PRODUCT NAME	ORDER CODE	QUANTITY	PRICE
Overseas postage add £1.00			
		TOTAL	

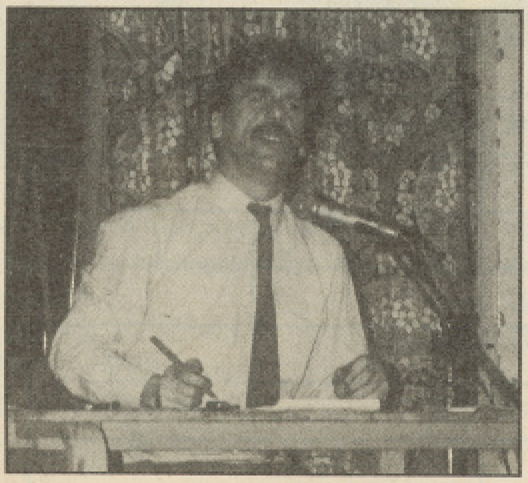
All orders should be sent to: YOUR COMMODORE, READERS SERVICES, ARGUS SPECIALIST PUBLICATIONS, ARGUS HOUSE, BOUNDARY WAY, HEMEL HEMPSTEAD HP2 7ST. Please allow 28 days for delivery.

COMPUTER AUCTIONS



Above: "And the bid from the spotty geek in the corner is..."

Below: "Who will buy this second hand toilet roll?"



When the Ed asked me to go to an auction I imagined *Christies* and *Sotheby's*, not some pokey college hall at **Southgate College of Technology** in North London. Still, the journey wasn't too bad and I got there in good time. "Take some photos", he said so I lugged my camera along as well.

You can imagine the looks I got when I entered the steamy, overflowing hall. As I walked past, heads turned to regard this spectacle of a man with a camera as though I had three heads and a Nikon. I pushed my way through the hordes of people until I could see what was happening at the front. Looking around the overfilled room, I saw people, more people and more people, and then a computer! And another, and a printer, a monitor, stacks of boxes and even more kit than I've got at home – rather a lot.

Advancing towards a smart looking *Star LC-10* printer I brushed past a friendly chap who said that the auction was about to start in a minute or two and I had better get myself a catalogue. He waved a wodge of paper at me. I thanked him and struggled towards a seething mass of people congregated at the front of the hall. Joining a queue, a man with a moustache sat himself down on a chair on the stage, cleared his throat and spoke into a microprhone. "The sale will start in five minutes. May I remind everyone that if you want to bid for anything in today's sale, you must register at the front," he pointed to the queue I was standing in.

At the front, I was given a card to fill in with my name and address,

just to make sure that if I bought something and then ran off without paying for it they could track me down. The top of the slip was torn off and handed to me. Scrawled on it was "378", my bidders number. "Are you taking photos for anything in particular?", a man in a red jersey asked as I requested a catalogue. I told him of my involvement with a certain computer magazine as I handed over £1 for the catalogue. As he noticed this he gave me the money back and told me to enjoy myself.

The crowds had now retired to a bundle of seats directly in front of the stage and the gangways along the sides were now more navigable. Looking around there were benches and more benches liteally overflowing with computer bits and bobs. Behind the seats were more rows of benches. On one sat various portable computers with odds and ends hiding between, on another the odds and ends ruled and complete machines were a minority. It soon became evident that there were not enough benches and equipment was begining to spill over onto the floor. Still people swarmed around virtually everything, lifting it, shaking it, switching things on and trying them out. This kind of behaviour is encouraged by the auctioneers so that you know exactly what you are buying and wheter it works or not. You have no come back on the equipment, and everything is sold "as is".

10:30am and the sale began with lot one, a set of IBM guide to operations software. My initial reaction was, who the hell wants that, but it soon became apparent that quite a few people did. Lots two to ten were the same as lot one and by the time the last one was sold the price had dropped considerably. Next came three lots of IBM BASIC software which gathered little interest. The first 40 items in the sale were all software, and the first bit of hardware was a IBM AT compatible mouse – whoopedo! As I leaned against a wall, with no prospect of sitting down for a good two hours, I thought just how boring this experience could be. I scanned the 13 pages of the catalogue and discovered, to my horror, that there were 1203 lots on sale that day, with many additionals on separate sheet which I picked up. In 20 minutes, just 30 odd lots had been sold and I was not looking forward to the prospect of staying for the rest of the day.

At the bottom of the first page were lots 65 to 104 which were a collection of various D-RAM chips. These came and went at ridiculously low prices considering the current value – nine 256K chips for just £28. Turning the page, I scanned down through the list of things and found myself ticking off items which I was interested in. "Lot 119 is a new Amstrad PC1640 system with 20MB hard drive and ECD monitor. Who will bid £600?" No takers. "£500" those sitting began to fidget but no bids were made. "£400" the auctioneer's voice took on that "stingy sods" tone. Getting fed up with the inactive audience he reduced the price to "£300". This time there was much mumbling and the buyers were obviously becoming interested. I heard someone close to me say "If it goes to £200 I'll have it." – me too I thought, and it did, "£200", the auctioneer was obviously becoming bored with this.

A hand shot high into the air, it was mine! Then someone close by raised his hand. "£220, do I see £240?" another hand rose and the bidding became fast and furious. I would have had better luck with an arcade coin-op. The system was finally sold for £425.

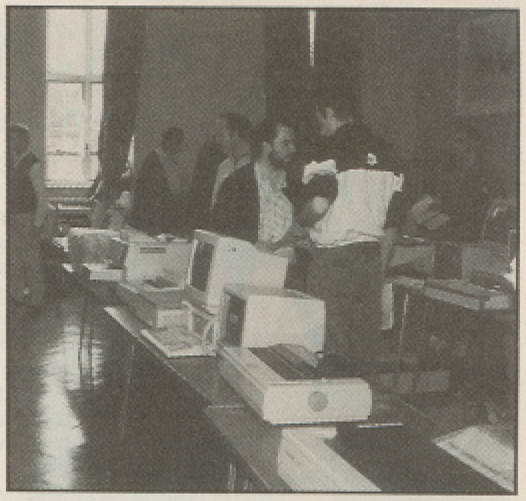
Lot 146 and a *Star LC-10* printer. Bidding began at just £40 and rose to only £95. I bidded for this too, but considered £95 just a little too much for a whim and gave in on ths too. By the time lot 148 came up – a NEC P6 24-pin – I was in the swing of things and really begining to enjoy myself.

At the end of the day I came home with 30 blank 3.5 inch discs, these cost just £6 per ten, a telephone, Psion Organiser II, an Atari 8-bit cassette recorder – I only paid £3 for this – some printer ribbons and a steel under-desk keyboard shelf.

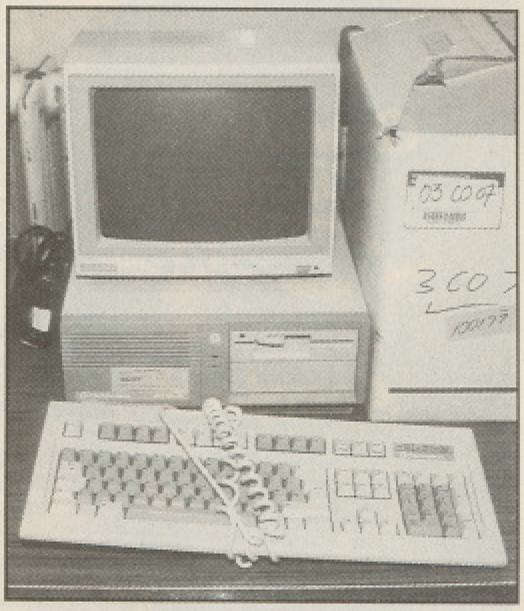
The auction I attended was organised by **John Russell & Co.** who are based in Croydon, Surrey. However, there are various other companies around the country who organise computer auctions, the more notable ones are listed below, others advertise in various journals. All items in the auction, unless stated otherwise in the catalogue, are subject to VAT which is added to your bill.

The auction turned out to be great fun, I came away wanting to go to the next one – so I'm off this Saturday to Mitcham and to the next auction. I probably won't buy anything, but it's fun all the same. It's interesting to talk to different people, and many bidders are regulars so you can make new friends and enjoy your hobby that little bit more.

Andrew Banner



Above: An abundance of goods for all to see.



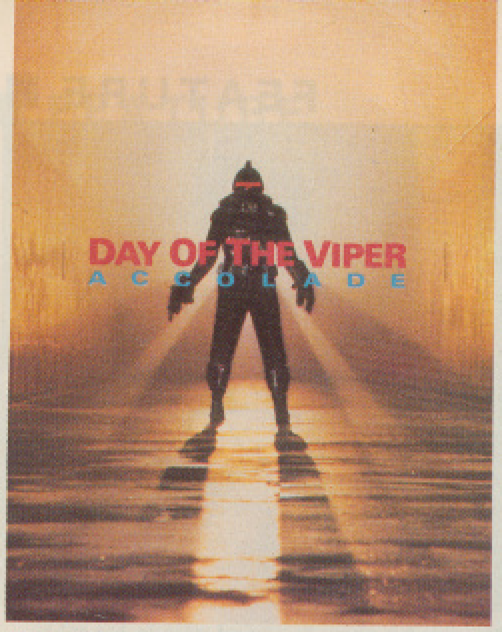
Above, My, what a mighty fine floppy drive you have!

Auctioneers

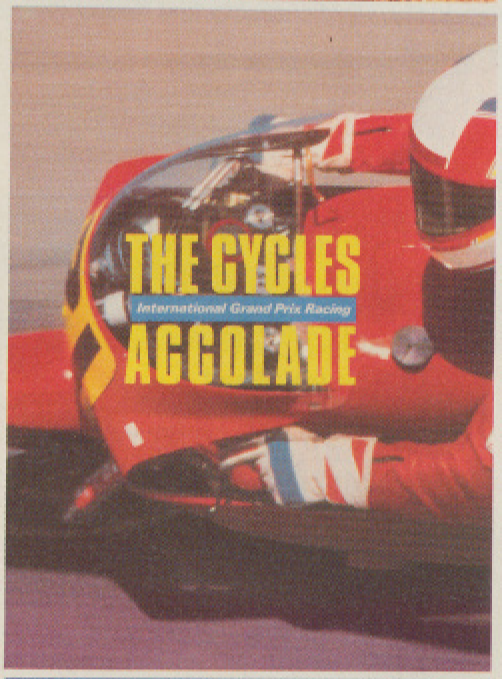
John Russell & Co.
Selsdon House
34 Selsdon Road
South Croydon
CR2 6BP
Tel: **(01) 681 5413**

MCD Computer Auctions
Unit 19
Loin Court
Danestil Industrial Estate
Basingstoke
RG2 0QU
Tel: **(0256) 810113**

Traderdesk
Unit 1-8
Manor Works
168 Worcester Road
Broomsgrove
Worcestershire
B61 7AZ
Tel: **(0527) 579120**









ACCOLADE ON THE HOME RUN

Accolade and *YC* have teamed-up to bring you yet another chance to win loads of goodies. This is to celebrate the enormous amount of games to come our way from the company responsible for Test Drive and others.

Two lucky winners will receive an Accolade T-shirt, Baseball cap and a rather rare miniature baseball bat. Ten runners-up will get a humungous poster of a pretty girlie to put on their bedroom ceiling.

All you have to do to be in with a chance of winning is answer the following three questions...

1. What is the name of the prequel to Hardball II?

2. What is the name of Accolade's best selling American football game?

3. Who is the major golf star currently sponsoring Accolade's Greatest 18 Holes of Major Championship Golf?

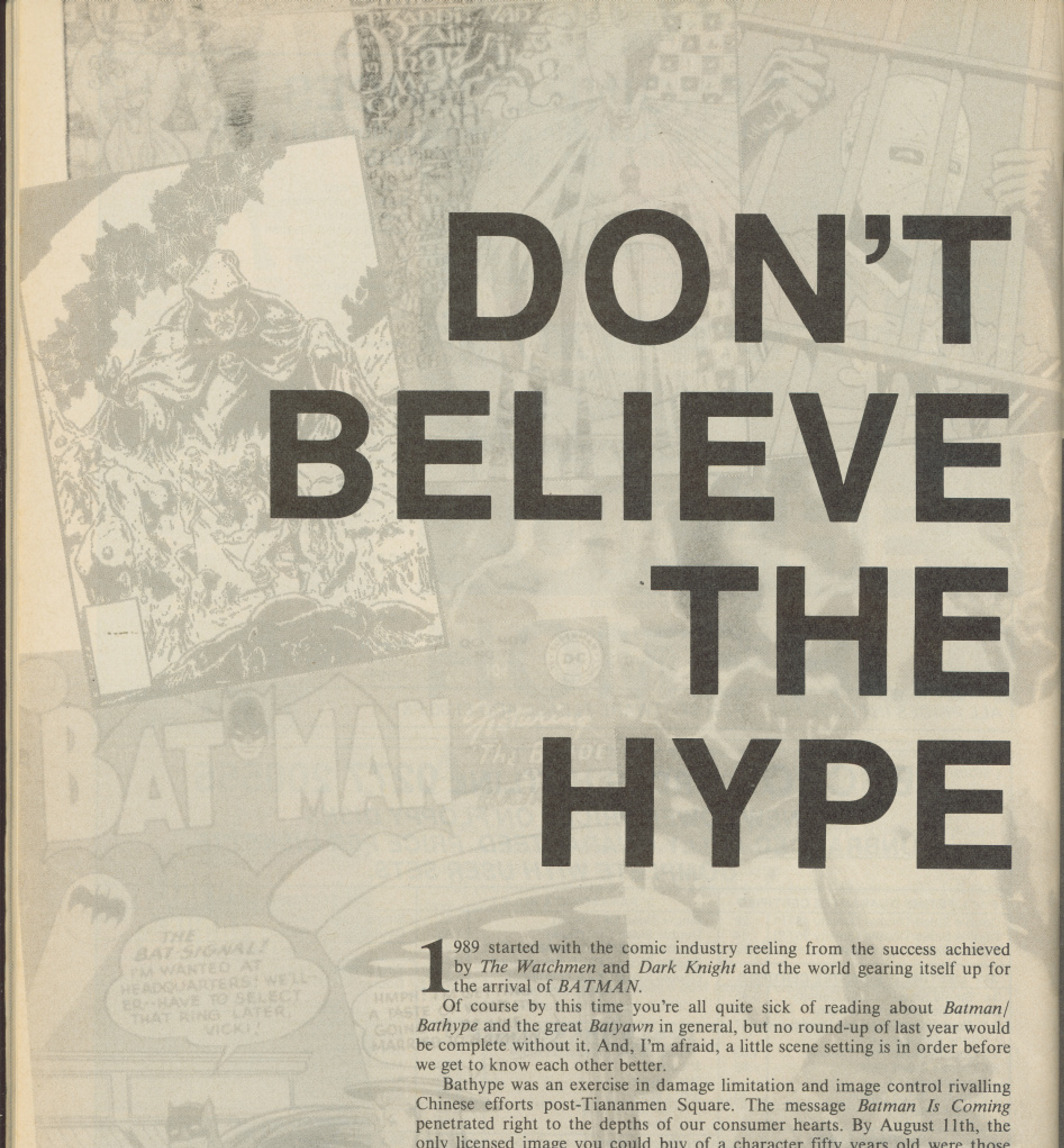
Scribble (in legible handwriting) the answers on the back of a postcard (or sealed envelope) and send them, by **30th December**, to:

Amazing Accolade Compo, YC, Argus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST.

The Slightly Deranged But Strictly Correct Rules

Entries will not be accepted from employees of Argus Specialist Publications or Accolade. This restriction also applies to employees families, agents of the companies, and martians called Nigel.

The entry restrictions form part of the rules and the Editor's decision is absolutely, with no room for argument or bribery (well, argument anyway!), final. No correspondence will be entered into, nor will dark alleyways lodging creepy crawlies. In the event of a solar eclipse, we reserve the right to use a piece of smoked glass.



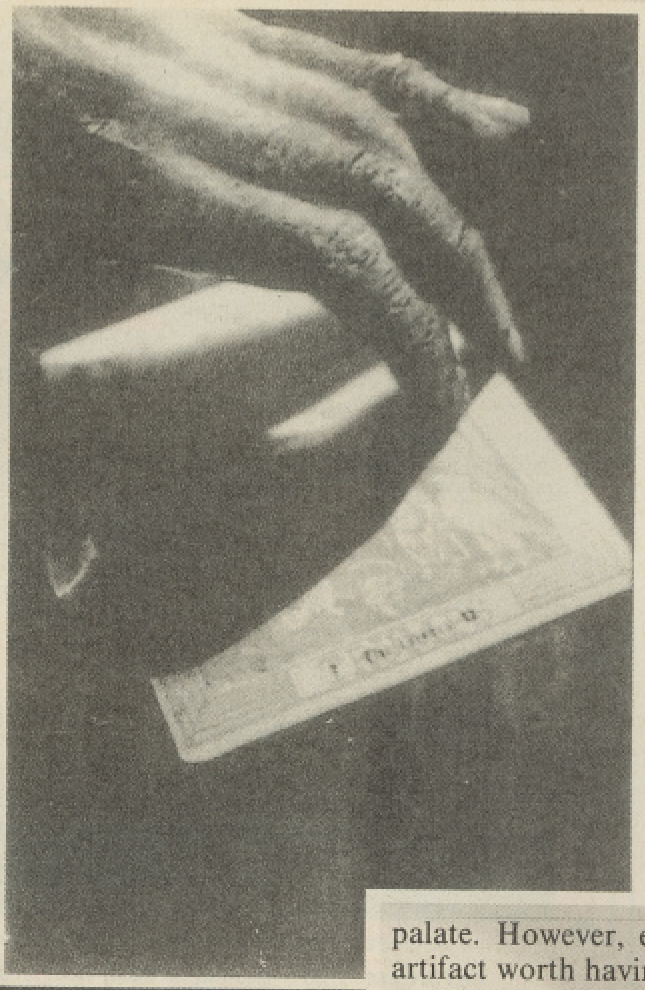
DON'T BELIEVE THE HYPE

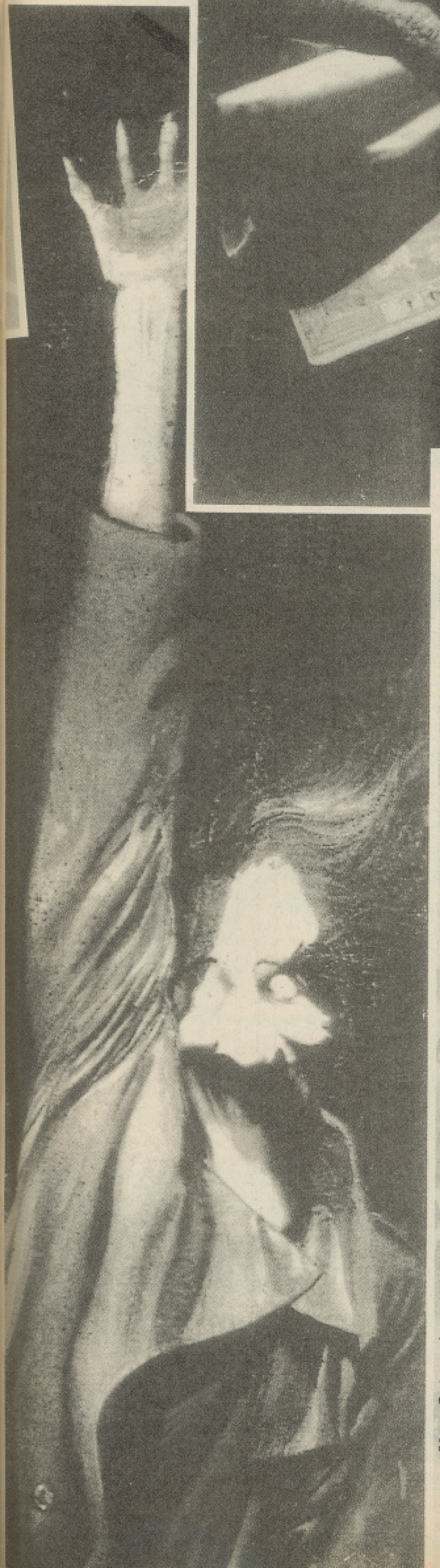
1989 started with the comic industry reeling from the success achieved by *The Watchmen* and *Dark Knight* and the world gearing itself up for the arrival of *BATMAN.*

Of course by this time you're all quite sick of reading about *Batman/Bathype* and the great *Batyawn* in general, but no round-up of last year would be complete without it. And, I'm afraid, a little scene setting is in order before we get to know each other better.

Bathype was an exercise in damage limitation and image control rivalling Chinese efforts post-Tiananmen Square. The message *Batman Is Coming* penetrated right to the depths of our consumer hearts. By August 11th, the only licensed image you could buy of a character fifty years old were those that came directly from Tim Burton's film. Firstly, Robin was killed of a in a perfunctory little epic called *A Death In The Family* (DC), that grabbed world headlines. Fifty years of teen icon were buried in a howl of commercial anguish. "What are we gonna do with all these luncboxes with Robin on them now?" cried more than one distraught DC exec.

Warner insisted that anything that contradicted their desired 'R' rated Batman should be witheld from the schedules; thus Grant Morrison/Dave McKean's *Arkham Asylum,* wherein the lunatics – the Joker, Two Face, the Penguin et al – take over, was pulled and censored, finally released when the video was safely in the corner shop. Alas, we shall never see Morrison's interpretation of The Joker, complete with stilletos, stockings and Madonna-like basque – lost forever to the demands of marketing and the sensitive American





palate. However, enough did escape the censors to make this the only Bat artifact worth having.

Finally, *Warners* instructed by law suit and copyright that there were to be no images that contradicted the greater *Warner* way; ie. anything that let you in on the fact that Batman was something over 5′3″, and the Joker something less than 14 stone.

And the movie? Who really cared that it was only a partial success (and a large part of that being Jack Nicholson) when everyone made such a killing?

When the party's over

Bathype did have one positive effect, along the way the message gradually became *Comics Are Coming*. New comics for a new age. Some serious fun.

Fleetway publishers of *2000 AD,* were first off the mark with *Crisis,* but this was about as hip as *The Tin Machine* until the introduction of Milligan/McCarthy's *Skin.* As far as the UK went, the year really went to *Deadline* with its electric mix of girls, guns and kind hearts. The world's first dance comic, brought us *Tank Girl* and a host of original, young, cartoonists that literally exploded off the page.

We might also have traced a little of the *Crisis* Band Aids, in Alan Moore and Bill Sinkiewicz's *Brought To Light*, except this was a harrowing tale that counted the cost of American foreign policy in swimming pools of blood. Definitely a highlight of last year. As was the first part of Moore's *From Hell* serialised in the horror anthology *Tabboo* (Spider Baby Grafix) a scalpel-like examination of Ripper mythology.

Other delights of last year were to be found in the resurgence of independent publishing in this country. Like the independent record companies, these independents can go into unexplored areas with an enthusiasm and energy that big companies with their unwieldy corporate structures can't hope to match. *Downside*, a soap opera set in a future East End council estate, and *Velocity*, a withering satire drawn from the junk culture are but two to watch out for.

On the other side of the pond, *Love and Rockets* (Fantagraphics Books) by Gilbert and Jame Hernandez, continued to lead the way with its gently surreal soaps set in the barrios of Los Angeles, and the mythical Mexican village of Palomar. Meanwhile America continued to snap up the best of British talent; Jamie Delano's *Hellblazer* (DC) drew its horror from the nightmare of the Thatcher decade, and Kevin O'Neill and Pat Mill's *Marshal Law* (Epic) gave a final slashing to the rotten core of the superhero.

The year ended on a high for me with the discovery of Munoz and Sampayo's *Sinner* (Fantagraphics Books), a comic that fuse Hollywood noire with 50's expressionism, to examine the human heart.

1989; there was more to life than *Batman.*

Stuart Green

COMPETITION

Comsoft Christmas Give-a-way In the grid below you will find all the things that make Christmas special. All entries to be returned by December 20th 1989. The First entry picked from the accumlated mail, will receive a Amstrad CPC 464 Computer with Coloured Monitor,

B	B	H	J	T	E	G	I	M	Z	C	S	V	J	B	W	A	Y	Q	R	D	X	E	Y	U
V	B	H	F	E	B	V	C	Z	F	E	U	E	O	S	V	H	Y	S	M	L	O	S	T	J
G	D	S	H	R	I	K	T	J	I	U	B	R	L	T	C	W	A	L	E	G	S	E	E	H
F	A	K	G	M	I	U	R	O	T	L	J	P	E	R	E	M	Q	L	L	A	J	I	D	H
U	I	M	N	O	N	N	D	P	E	Y	H	S	E	D	T	S	T	P	N	Y	R	G	F	K
U	J	E	E	T	O	S	K	S	R	P	D	R	W	S	N	S	S	T	K	S	I	H	L	Y
P	Y	I	S	S	L	D	M	S	L	E	I	D	I	C	I	E	A	A	E	V	E	S	P	P
I	X	E	N	O	V	V	W	O	E	F	S	R	C	M	L	C	L	E	C	M	J	O	N	A
S	H	S	R	G	S	W	D	I	G	I	H	E	P	T	L	V	R	A	I	L	A	O	F	R
C	M	A	T	Z	L	U	U	O	L	C	T	Q	N	A	P	T	X	T	C	C	I	H	P	A
H	C	Z	K	H	R	E	L	E	E	L	A	R	U	T	S	O	E	K	Y	T	J	S	M	E
W	K	X	V	W	G	T	B	T	G	O	M	S	A	A	S	L	S	S	A	H	D	S	B	X
O	H	W	J	L	U	I	I	E	S	Y	Q	G	M	P	U	Z	L	R	J	R	N	Z	V	I
N	E	C	J	R	T	H	L	U	L	L	Y	T	O	Y	X	D	O	F	A	R	N	T	B	M
S	G	P	K	Y	W	S	U	C	S	L	S	Q	Y	K	E	C	S	C	E	H	U	A	W	N
F	W	E	R	A	T	E	O	G	Z	I	S	H	I	A	E	X	S	T	R	L	U	I	G	Y
S	Y	H	J	A	Q	M	S	N	R	I	T	A	E	D	T	A	N	I	E	M	N	D	R	N
I	C	X	R	J	P	R	G	H	B	Q	M	R	W	G	M	A	Z	L	E	E	J	B	L	Z
W	U	S	F	U	E	O	C	U	F	J	A	E	T	T	L	X	U	H	D	V	U	Z	W	J
G	J	M	T	K	Q	Z	H	B	T	W	A	N	S	J	P	F	C	U	N	C	U	B	Z	X
B	U	E	C	R	X	N	G	R	T	T	U	I	I	M	S	Q	E	C	I	P	J	B	X	N
I	R	A	A	X	J	K	U	F	S	T	R	Y	X	Q	F	Z	C	Z	E	B	Z	C	B	L
S	R	A	J	I	S	X	O	S	S	H	A	A	M	J	R	A	O	F	R	R	M	F	Z	Z
C	G	Y	E	V	U	S	Y	K	C	Y	X	H	Q	K	Y	O	N	K	V	D	N	O	B	B

BOBBLES — CELENDERS — CAROLS — CASSETTES
CHESTNUTS— CHIMNEY CRACKERS — CHRISTMAS CARDS —
COMPUTERS — DECORATIONS — DRINKS — CHRISTMAS TREES —
GAMES — GOODWILL— —HOLLY — JINGLEBELLS LANTERNS —
LIGHTS — LOG FIRE — MISTLETOE — NUTS — PARTIES — PRESENTS
REINDEER RUDOLPH — SANTACLAUS — SLEIGH — SNOW —
SOFTWARE — STARS TURKEY — WINE — WHITECHRISTMAS —
YULETIME

Name: ______________________________

Address: ______________________________

DATEL ELECTRONICS

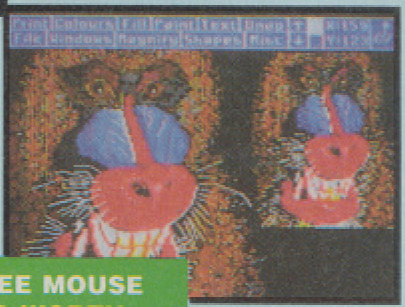
THE ULTIMATE GRAPHICS PACKAGE...

SPECIAL OFFER PACK!

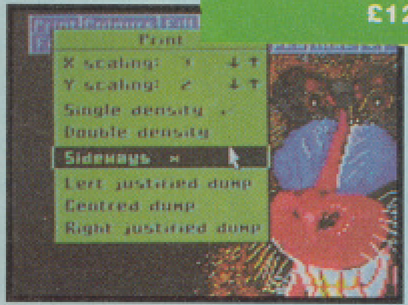


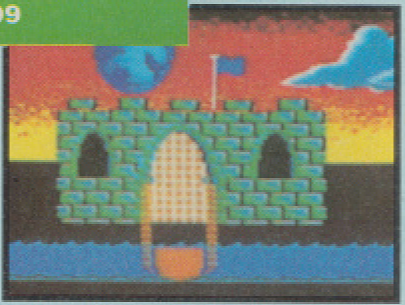
ALSO GEOS COMPATIBLE





INCLUDES FREE MOUSE MAT/HOLDER WORTH £12.99





COMMODORE 1351 MOUSE

COMPLETE WITH

OCP

ADVANCED ART STUDIO™

ONLY £34.99

TOTAL PACKAGE INCLUDES 1351 MOUSE/ MOUSE MAT/HOLDER AND OCP ADVANCED ART STUDIO

- **1351 Mouse is a high resolution two button mouse featuring optical counting, teflon guides, microswitches, rubber coated ball and high quality interface.**
- **When combined with OCP Advanced Art Studio this graphics package is quite simply the best system available. The features are unmatched...**

- Create an image - shrink it, expand it, move it, rotate it, copy it, colour it etc., etc.
- Spray patterns or shades, make elastic lines - stretch and manipulate shapes.
- Zoom in to add detail in fine mode.
- Pulldown/Icon driven menus for ease of use.
- Mouse operation, plus joystick and keyboard control.
- 16 pens, 8 sprays, 16 brushes - so flexible anyone can create superb graphics easily.
- Full cut and paste facilities plus excellent printer support.
- Pixel edit, font editor, flip, invert, rotate, solid or textured fill and professional manual make the Advanced Art Studio simply the best graphics package.



ALSO GEOS COMPATIBLE

- The 1351 Mouse has two selectable modes - Mouse or Joystick mode for maximum compatibility.
- Even works with the Best Selling GEOS utilities.
- Superb quality.



FREE!

MOUSE MAT AND MOUSE HOLDER (WORTH £12.99) WITH EACH PACKAGE

ONLY WHILE STOCKS LAST

A TOTAL GRAPHICS PACKAGE

SAVE £40*

*NORMAL RRP OVER £75.00

- NO OTHER GRAPHICS PACKAGE CAN OFFER SO MUCH AT SUCH A PRICE!!
- OCP ADVANCED ART STUDIO ALONE NORMALLY RETAILS FOR £25.00!! THE MOUSE HAS A NORMAL PRICE OF £30.00!! NOW YOU CAN BUY BOTH FOR ONLY £34.99 AND GET A MOUSE MAT AND HOLDER (WORTH £12.99) ABSOLUTELY FREE!!
- WE HAVE LIMITED NUMBERS OF THESE PACKS - SO BUY NOW!!

WHAT THE MAGAZINES HAD TO SAY...

COMMODORE COMPUTING "CLASSIC"

C.T.W. "PICK OF THE WEEK"

C.C.I. "BEST GRAPHIC PRODUCT OF THE YEAR"

ALL ORDERS NORMALLY DESPATCHED WITHIN 48 HRS

HOW TO ORDER ...

BY PHONE	BY POST	FAX
0782 744707 24hr Credit Card Line	Send cheques/POs made payable to "Datel Electronics"	0782 744292 UK ORDERS POST FREE EUROPE ADD £1 OVERSEAS ADD £3

PRICES AND SPECIFICATIONS CORRECT AT TIME OF PRESS AND SUBJECT TO CHANGE WITHOUT NOTICE

CALLERS WELCOME - Please reserve goods by telephone prior to visit.

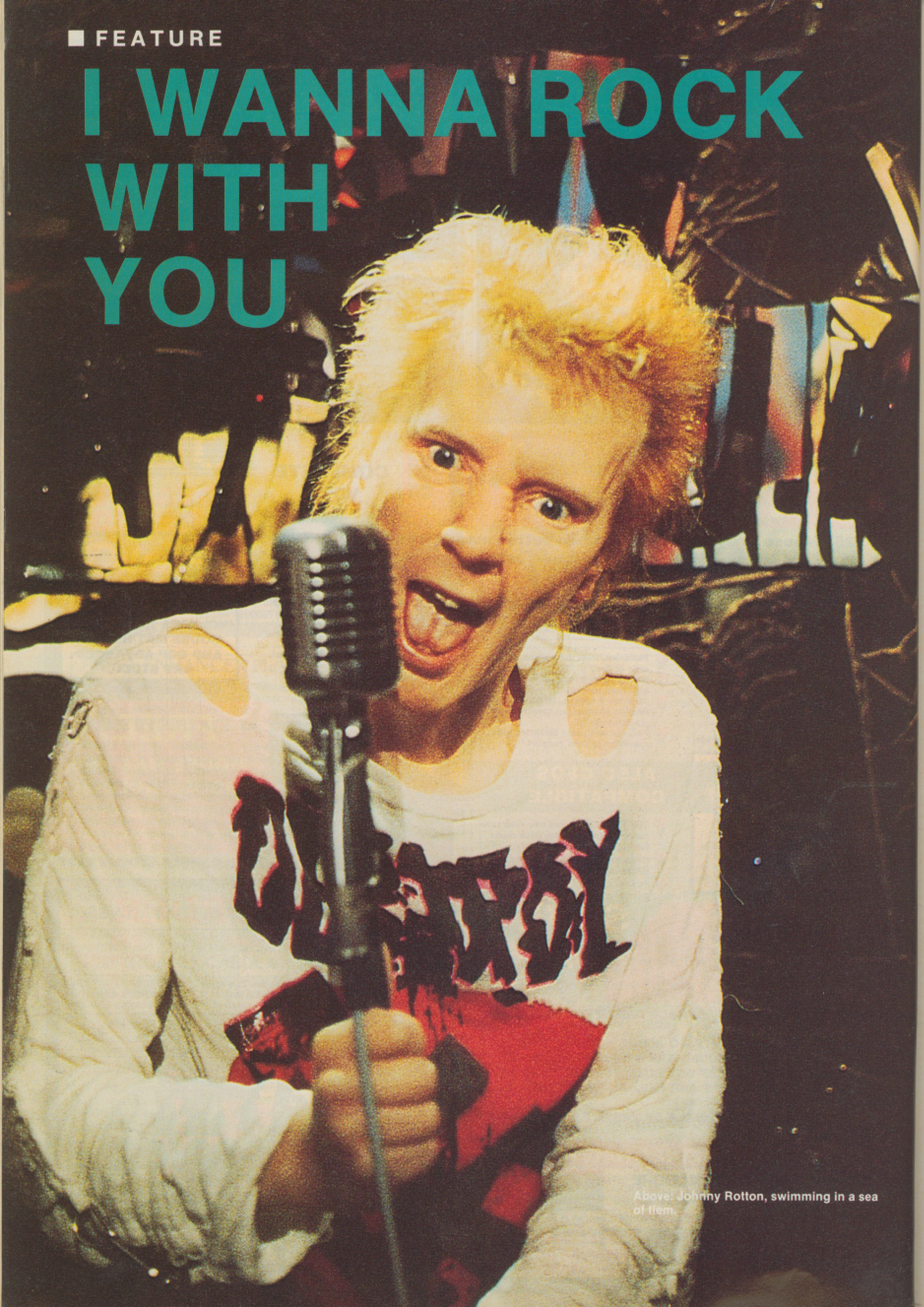
DATEL ELECTRONICS

DATEL ELECTRONICS LTD., FENTON INDUSTRIAL ESTATE GOVAN ROAD, FENTON, STOKE-ON-TRENT, ENGLAND.

SALES ONLY	TECHNICAL ONLY
0782 744707	0782 744324

FEATURE

I WANNA ROCK WITH YOU



Above: Johnny Rotton, swimming in a sea of ttem.

Rik Henderson, the man with an enormous wobbly dictaphone, visits Britain's latest tourist attraction, the Rock Circus

It was the boozing, you see, that ruined old Baz's career. But when we were going strong in the charts, the parties were fantastic. Bob was there, so was Jimi, and Janis made a short appearance before we were all locked up. You should have seen the papers, oh how we chortled.

Unfortunately the imagination can get somewhat wild, and scenes like this live only in the mind of a humble journo, like myself. Bob Marley, Jimi Hendrix and Janis Joplin are sadly deceased, so to come face to face with them is something only Burke and Hare could do. Rock Circus, however, exists to recfity this fact, and allows you to come within breathing distance of exact replicas of gone, but not forgotten, stars.

Situated in the heart of the West End, the venue, which opened its doors on the 7th August 1989, is part of the Tussauds Group of tourist attractions (best known for their Madame Tussaud's and London Planetarium). And it is easy to see where the inspiration has stemmed from. It features many waxworks of the most famous of the rock stars, and could be likened to the Chamber of Horrors, with the genre being the major change.

Upon entrance visitors are supplied with headsets. These pieces of equipment allow wearers to hear only the sound emitting from the area designated to a particular exhibit. This is done via infra red signals that are picked up by the headset and converted into sound. Unfortunately this provokes one small problem which I discovered, if your headset is slightly off-line the beam will not be picked up, and therefore no sound will be heard. This is rectified by a small adjustment in head angle, so it's not a major worry.





Above and right: Jerry Lee Lewis and Art Garfunkel.





Above: Bob Marley, a true legend.

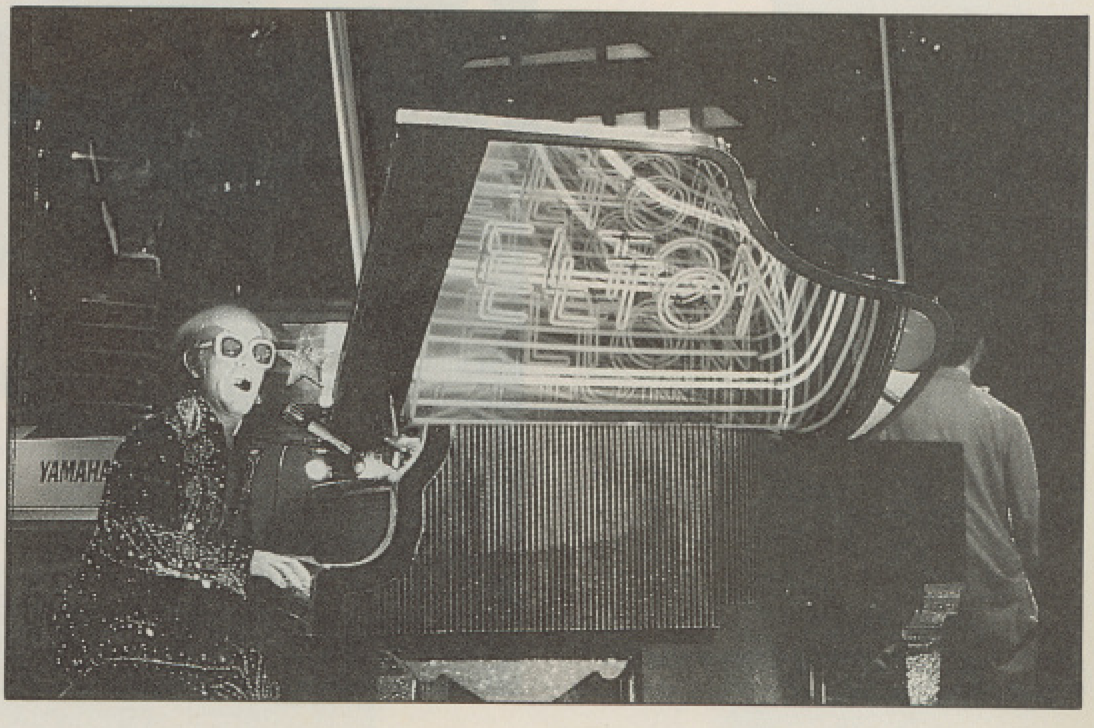
It would be nigh-on impossible to include every influencial rock star from the 40s-90s, but Rock Circus has had specialist help from Paul Gambaccini in choosing the ones that would best represent the industry. Some of the stand-alone exhibits are very well thought-out indeed.

In the centre of the lower floor (there being three floors in total) there is a large revolving stage with Elton John, Stevie Wonder, and Little Richard, all playing pianos, and in the centre, at the end of the 7 minute show, appears Elvis Presley in all his splendor (with hamburger filled stomach and all). And all around the edges, and on the second floor, are smaller scenes.

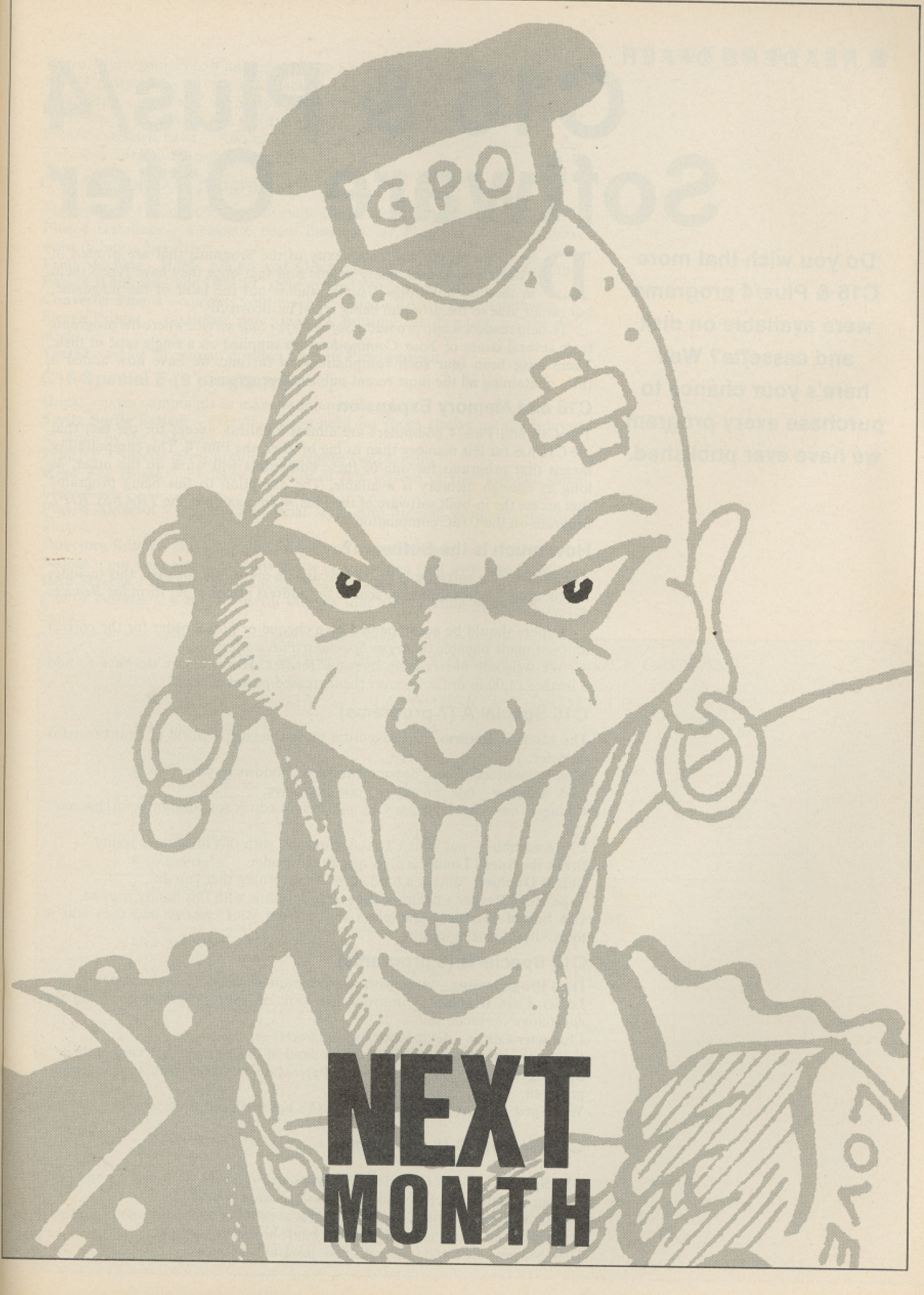
It is the final show that is definitely the most worth seeing as it is situated in the largest revolving theatre in Europe, and it features audio animatronic figures (much like certain Group Editors). These are bionic figures that are controlled by a whapping great computer system. Unfortunately, although the show is very good indeed (especially when the volume on your headset is turn up to full blast), the bionic stars sometimes act in a way not too disimilar to a Gerry Anderson creation. But all said and done, it is quite spooky to see models that move in time to music; and in an elaborate way too.

Not so much an education, not so much a feature of excitement, more a cross between the two. Rock Circus cost £10 million to erect and can be yours for a few hours for only £4.20 (£3.15 for children and concessions). Worthwhile, yes; revolutionary, probably!

The Rock Circus, London Pavilion, Picadilly Circus, London (Opposite Eros).



Right: Elton John making a spectacle of himself.


GPO
NEXT
MONTH

C16 & Plus/4 Software Offer

Do you wish that more C16 & Plus/4 programs were available on disk and cassette? Well here's your chance to purchase every program we have ever published.

Due to the length and complexity of the programs that are printed in *Your Commodore*, many people find that once they have typed them in they do not work. Usually, this is not the fault of the magazine, but rather, due to the program being typed in incorrectly.

To help readers we do provide a *Software for Sale* service where the programs from several issues of *Your Commodore* are supplied on a single tape or disk. There have been four such compilations so far and we have now added a fifth, containing all the most recent published programs.

C16 and Memory Expansion

The C16 and Plus/4 computers are almost identical, except for the fact that the C16 has far less memory than its big brother, the Plus/4. This compatibility means that programs for one of these computers will work on the other, as long as enough memory is available. The exception to this being programs that access the in-built software of the Plus/4, for example, the *TRANSCRIPT* program on the C16C compilation.

How much is the Software?

The price of the software is £5.00 for cassette and £7.00 for disk, this includes instructions. Orders should be sent to the address on the order form for *Readers Services.*

Orders should be accompanied by a cheque or postal order for the correct amount made payable to *Argus Specialist Publications.*

We welcome orders from overseas readers. However, we do have to add a further £1.00 in order to cover the increased postal charges.

C16 Special A (7 programs)

The Monster Returns – an adventure set in the creepy world of Frankensteins monster.
Simple – add icons, pull down menus and windows to your Plus/4.
Disk Monitor – talk directly to your disk drive.
Change Your Character – a C16 and Plus/4 editor to redesign your character sets.
C16 Assembler – put your C16 to serious use with this invaluable utility.
Break the Speed Limit – a high speed tape loader.
Plus/4 Dumper – obtain a hard copy of everything that you do.
Tape Head Reader – examine the storage routine with this handy routine.
C16 Sound Sampler – sample a sound from your cassette and then edit it to produce amazing results.

C16 Special B (6 programs)

Dual Programming – work with two programs in memory at the same time.
Lower Case Graphics – improve the look of your programs by using the alternative character set.
Character Editor – devise your own character set.
Cribbage – challenge your Plus/4 to a hand of this popular pub card game.
Spelling Checker – avoid those embarrassing mistakes with this ingenious program.
Word-pro Add-on – improve the Plus/4's built-in word processor.

C16 Special D (8 programs)

C16 Sprites – your C16 or Plus/4 sprites like those to be found on the C64. A demo routine is included to show you just what is possible.
Plus/4 Animator – store a series of pictures in memory to create moving pictures.
Rebound – an excellent version of the latest breakout style game.
Disk Menus – find and load your disk programs with ease.

Typro – turn your Plus/4 and printer into a powerful electronic typewriter.
Plus/4 Assembler – an excellent machine code assembler.
Transcript – owners of the Script Plus Cartridge can now convert their Plus/4 test files to work with this word processor.
Plus/4 extended basic – Add almost 40 new commands to the Basic on your Plus/4 or C16 with memory expansion.

C16 Special D (9 programs)

Money Plus/4 – organise your financial affairs with this superb program.
Plus/4 Database – a cassette based database for Plus/4 owners who don't want to buy a disk drive.
Fruit Machine – Holds, nudges and a time limit make this a challenging game.
Plus/4 Windows – add IBM PC style windows to your programs.
Converter Plus/4 – converts your machine code to BASIC data statements.
Sleeve Printer – catalogue your disks by printing the directory on the disk sleeve.
Text80 – create 80 column displays on your Plus/4 screen.

C16 Special E (9 programs)

Oops! – extra commands to make programming easier.
Spritz Sprite System – everything you need for those elusive sprites enjoyed so much by the C64 users.
PrintFX – Special effect printing brought to your screens.
Head For Home – Excitement galore in this version of that popular game Ludo.
Plus/4 Autorun – create commercial style auto-running programs on your Plus/4.
Directory Editor – customise your disk directories with ease.
Nufont – put your creative talents to use and produce your own type faces.
Help Screens – all that important information at your finger tips.
Plus/4 Utilities – a trio of useful utilities that makes using your disk drive easier.

ORDER FORM - PLEASE COMPLETE IN BLOCK CAPITALS

NAME	QTY	TAPE/DISK	ORDER CODE	PRICE
C16 Special A		TAPE	YC16A	£5.00
C16 Special A		DISK	YD16A	£7.00
C16 Special B		TAPE	YC16B	£5.00
C16 Special B		DISK	YD16B	£7.00
C16 Special C		TAPE	YC16C	£5.00
C16 Special C		DISK	YD16D	£7.00
C16 Special D		TAPE	YC16CD	£5.00
C16 Special D		DISK	YD16DD	£7.00
C16 Special E		TAPE	YC16CE	£5.00
C16 Special E		DISK	YC16DE	£7.00
Overseas post £1				
			Total	

NAME ....

ADDRESS...

POSTCODE ....

I enclose a cheque/postal order for £................ made payable to *ARGUS SPECIALIST PUBLICATIONS.*

All orders should be sent to: YOUR COMMODORE, READERS SERVICES, ARGUS SPECIALIST PUBLICATIONS, ARGUS HOUSE, BOUNDARY WAY, HEMEL HEMPSTEAD, HP2 7ST.

Please allow 28 days for delivery.

YOUR COMMODORE

Lineage: 53p per word.
(+ VAT)
Semi display: £11.50 plus VAT per single column centimetre minimum 2cm. Ring for information on series bookings/discounts.

All advertisements in this section must be prepaid.
Advertisements are accepted subject to the terms and conditions printed on the advertisement rate card (available on request).

0442 66551

Send your requirements to:
CLASSIFIED DEPARTMENT
ASP LTD. ARGUS HOUSE,
BOUNDARY WAY,
HEMEL HEMPSTEAD HP2 7ST.

SOFTWARE

ONLY POOLS AND HORSES

FOOTBALL BOXFORM £14.95 (+ £2 for 3" disc)

THE ONLY POOLS PROGRAM WRITTEN BY A GENUINE EXPERT WHO HAS BEEN PROFESSIONALLY EMPLOYED AS SUCH BY THE LEADING POOLS COMPANY. HE KNOWS HOW TO HELP YOU WIN.
THE PROGRAMME HAS FORECAST ON AVERAGE 50% MORE DRAWS THAN WOULD BE EXPECTED BY PURE CHANCE.

FOOTBALL BOXFORM is not a gimmicky play thing but a serious statistical analysis of football form. Its sole objective is to improve the chances of winning on the pools or fixed odds and no other program comes near to tackling the problem so thoroughly. Homes aways and draws are shown in order of merit and true odds given for every match. Merit tables show at a glance the teams currently in form and those having a lean spell. Covers league and non-league clubs.

BOXFORM & HANDICAP WINNER £14.95 (+ £2 for 3" disc)

Two programs for the price of one. Easy to use and they never go out of date. All you need is a few minutes with a daily paper. **BOXFORM** weighs up a race by considering the many facets of form. Easily amended to suit the user's ideas. **HANDICAP WINNER** shows the value for money bets. Hundreds of winners in handicaps this year at 25/1, 20/1, 16/1, 15/1....etc,etc.

SPECIAL PRICE of £24.95 (+ £2 for 3" disc) for all of the above programs

Why pay inflated prices? **BOX**oft **CLEVER** and get the **BEST**

Available on tape or disc for SPECTRUM, CMD C64/128, AMS, CPC's, BBC.B from:

BOXSOFT (YC), 65 Allans Meadow
Neston, South Wirral. L64 9SQ
Credit card holders may phone ***051-336-2668****(24 hrs)*

IF YOU WOULD LIKE TO SELL YOUR PRODUCT TO OVER 70,000 C64 & C128 USERS IF YOU CALL ME, TONY FLANAGAN I CAN MAKE YOUR DAY.

PUBLIC DOMAIN SOFTWARE for the C64/128.

We have 150 disks full of all types of Programs
All disks are £2.95 each
NOW FOR THE +4
from £3.75 per disk.
Send SAE or phone for free catalogue
(state model)

Kingsway Computer Services
72, Glencoe Road, Sheffield.
S2 2SR **Tel: (0742) 588429**

ADVERTISERS

CLASSIFIED COUPON

ALL CLASSIFIED ADVERTISEMENTS MUST BE PRE-PAID.
THERE ARE NO REIMBURSEMENTS FOR CANCELLATIONS.
CLASSIFIED DEPT. ARGUS HOUSE, BOUNDARY WAY, HEMEL HEMPSTEAD HP2 77ST.
RATES: Lineage 58p per word (VAT inc) Semi-display: £10.95 + VAT per single column cm minimum size 2cm. Series discounts available.

I enclose my Cheque/Postal Order for £ ....for .... insertions, made payable to Argus Specialist Publications.
(Delete as necessary)

PLEASE DEBIT MY ACCESS/BARCLAYCARD NO

EXP. DATE ....

£................**FOR**................**INSERTIONS**

Name...

............................**Post Code**.......................................

Daytime Tel No....

Signature..........................**Date**..............................

☐ **FOR SALE** ☐ **SOFTWARE** ☐ **SPECIAL OFFERS** ☐ **OTHER**

SERVICES

COMMODORE SUPPLIES

C64 Power Supply	£19.95
CBM Plus 4 Power Supply	£29.95
C-16 Power Supply	£12.95
1530 Datasette	£27.95
1531 datasette	£27.95
Simons Basic Extension	£9.95
Serial Lead (for d/drive/printer)	£5.95
C64 reset Switch	£4.95
Dust Cover (please state computer)	£3.50

Prices include VAT & P&P. Allow up to 14 days for delivery. Chq/PO to:
Omnidale Ltd (Y.C.), 23 Curzon Street,, Derby, DE1 2ES. Tel 0332 291219.

SPECIAL OFFERS

"You better believe OUR PRICES"

Amiga 500, games, Photon paint	£369.00
Commodore A1541 CII D/drive	£147.50
C64 Compatible Data Recorder	£24.50
Commodore 1351 C64/C128 Mouse	£19.99
C64 Compatible Power Supply	£19.99
C64 Slimline Replacement Case	£20.00
Konix Speedking Joystick	£9.75
Konix Navigator Joystick	£12.75
3.5" Disks x 10	£9.50
5.25" x 10	£4.50
Disk Box 80 x 3.5" (Lockable)	£6.99
Disk Box 80 x 5.25" (Lockable)	£6.99

ALL PRICES INCLUDE VAT
P/P. £1.50 SMALL ITEMS, £3.50 FOR HARDWARE

Crofton Micro Supplies
FREEPOST, London. SE4 2BR
Telephone 01-469-3246

YOUR COMMODORE SPECIALS

TECH DRAW 64 - A comprehensive technical illustration aid for C64 owners for both disk and tape. Commands available include LINE DRAW, RAYS, BOX, CIRCLE, ARC, ELLIPSE, FREEHAND, FILL, HATCH & TEXT. Wipe copy, move and rotate, save and load or print your drawing all for £8.95 tape or disk. Order Codes TD64T (tape) TD64D (disk)

Full details in Your Commodore July 1987.

SPEEDY ASSEMBLER

Your Commodore's very own Assembler, a 100% memory resident program for loading from tape or disk, featured in the Your Commodore Machine Code Series and now the Y.C. standard assembler only £9.95 Tape or Disk. Order Codes YSPASSD (disk) YSPASSR (tape)

Order from Your Commodore Readers Services at 9, Hall Road, Maylands Wood Estate, Hemel Hempstead Herts HP2 7BH. Please make cheques payable to A.S.P. Ltd., or telephone your Access/Visa order on 0442 41221

TO ADVERTISE YOUR COMMODORE REPAIR SERVICES CALL: TONY FLANAGAN ON 0442 66551

RATE: £11.50 (+ VAT) PER SINGLE COLUMN CM
STANDARD SIZE 4cm x 1 col = £46.00 (+ VAT)

Access | BARCLAYCARD VISA

TELEPHONE BOOKINGS WELCOME

TERMS & CONDITIONS

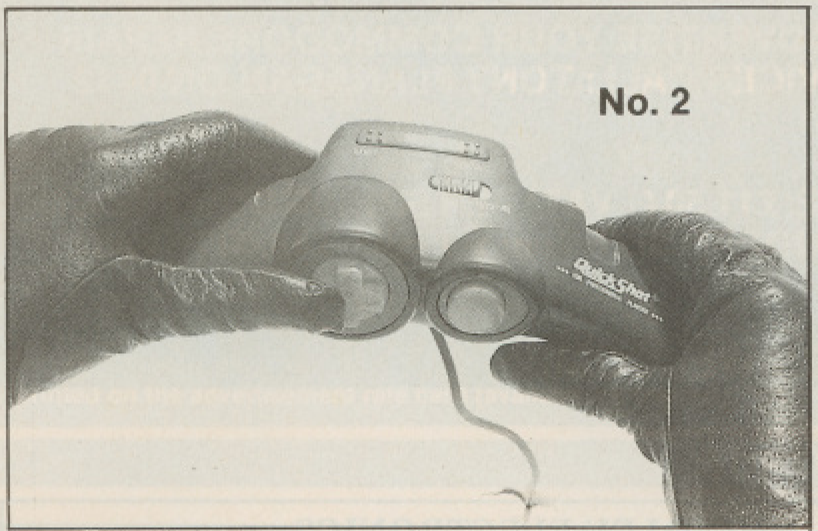
CLASSIFIED ADVERTISING TERMS & CONDITIONS

Our terms for new advertisers (semi-display and lineage) are strictly pro-forma payments until satisfactory reference can be taken up (excluding recognised advertising agencies). Cheques and P.O.'s should be crossed and made payable to ARGUS SPECIALIST PUBLICATIONS and sent to:

THE CLASSIFIED DEPT
ARGUS HOUSE, BOUNDARY WAY,
HEMEL HEMPSTEAD HP2 7ST.

There are no reimbursements for cancellations. Advertisements arriving too late for a particular issue will be inserted in the following issue unless accompanied by instructions to the contrary. It is the responsibility of the advertiser to ensure that the first insertion of every series is published correctly, and corrections must be notified in time for the second insertion, otherwise the publishers will not accept liability or offer any reduction in charges.
All advertising sales are subject to Government Regulations concerning VAT. Advertisers are responsible for complying with the various legal requirements in force eg: The Trade Description Act, Sex Discrimination Act & the Business Advertisements (disclosure) order 1977.
Full Terms & Conditions of Advertising available on request.

THE END IS NIGH



The Computer Industry Karma Sutra

And it doesn't even require batteries

In the Limelight

On Thursday 28th December, US Gold invited nigh on 700 journos and industry noticables to the Limelight Club in aid of their 5th birthday. Rik Mayall was the guest of honour, and a mighty funny one he was too. But the night was made by the stunning dancing skills of Stuart 'Travolta' Cooke.

Journalists gasped in awe as his incredible strutting moves wiped the floor clean (not last because he had dusters strapped to his feet). Distributors oggled as he spun in time to the music. Software Houses slavered as he twisted his body into shapes only silly putty could imitate. Watch your neighbourhood dancefloor now, for the funky cat Cooke may be appearing near you soon.

Press hard at work

At the recent PC Show, members of the press shocked many traders and companies by performing an act known as 'work'. After the five minutes were up though, it was a reassuring sight to see them huddled in the bar.

One of our sources revealed, "We didn't know what had come over them. The Argus team suddenly descended upon us and demanded that we chat about 'business'. I can tell you now, I was extremely frightened!"

We must stres to readers that this is not common amongst magazine staff, and should not be assumed as representative of the industry.

It's a wobbler too

Those who enjoyed the half page on page 57 in last month's YC, will be pleased to note that several other World-beating Wordsmiths missed their penalties too. I really do not wish to be cruel by saying who, so I'll keep quiet for the sake of YC's advertisement manager and a certain publisher at Emap. It would be rather embarassing if anybody found out!



Famous footballing megastar signs for computer magazine

A very famous soccer star has been transferred to a computer magazine in a sensational scoop. Sources have not yet revealed who he is, or what magazine is involved, but we know that it is in the position of Sales Executive.

By the way, YC has signed ex-Norwich city player Tony Flanagan as well!

IT'S A WOBBLER!



YC SURE SHOT

Wobbling Y.C. Editor wobbles the frame work? At a charity penalty shoot out. After hitting the absolutely mega wobbler in to wobbling orbit he fell into an Epper-wobbling wobbler causing much concern! (they all went to lunch).
All the advertising team of Y.C. wish Rik an absolutely wobbling football career.

...it's dynamite!

POWER CARTRIDGE

FOR YOUR COMMODORE

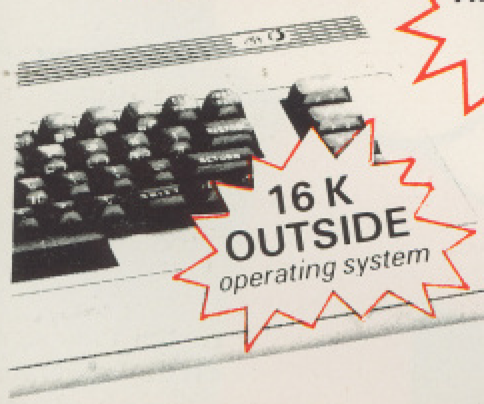
64/128

SO MUCH FOR SO LITTLE

- * POWER TOOLKIT
- * POWER MONITOR
- * TAPE & DISK TURBO
- * PRINTERTOOL
- * POWER RESET
- * TOTAL BACKUP

TRIED AND TESTED — OVER 100,000 SOLD IN EUROPE

AVAILABLE FROM ALL GOOD COMPUTER RETAILERS



16 K OUTSIDE operating system

TRADE AND EXPORT ENQUIRIES WELCOME

YOU WILL WONDER HOW YOU EVER MANAGED WITHOUT IT



ONLY £14.99 INC. VAT

POWER TOOLKIT

A powerful BASIC-Toolkit (Additional helpful commands) that considerably simplifies programming and debugging.

AUTO	HARDCAT	RENUMBER
AUDIO	HARDCOPY	REPEAT
COLOR	HEX$	SAFE
DEEK	INFO	TRACE
DELETE	KEY	UNNEW
DOKE	PAUSE	QUIT
DUMP	PLIST	MONITOR
FIND	ILOAD	BLOAD

RENUMBER : *Also modifies all the GOTO's GOSUB's etc. Allows part of a program to be renumbered or displaced.*
PSET : *Set up of printer type.*
HARDCAT : *Prints out Directory.*

The toolkit commands can be used in your programs.

DISK TOOL

Using POWER CARTRIDGE you can load up to 6 times faster from disk.
The Disk commands can be used in your own programs.

BLOAD	DVERIFY	DIR
DSAVE	MERGE	DEVICE
DISK		

MERGE : *Two BASIC programs can be merged into one.*
DISK : *With DISK you can send commands directly to your disk..*

TAPE TOOL

Using POWER CARTRIDGE you can work up to 10 times faster with your data recorder. The Tape commands can be used in your own programs.

LOAD	SAVE	VERIFY
MERGE	AUDIO	

POWERMON

A powerful machine language monitor that is readily available and leaves all of your Commodore memory available for programming.
Also works in BASIC-ROM, KERNAL and I/O areas.

A ASSEMBLE	I INTERPRET	S SAVE
C COMPARE	J JUMP	T TRANSFER
D DIS-ASSEMBLE	L LOAD	V VERIFY
	M MEMORY	W WALK
F FILL	P PRINT	X EXIT
G GO	R REGISTER	$ DIRECTORY DOS Commands
H HUNT		

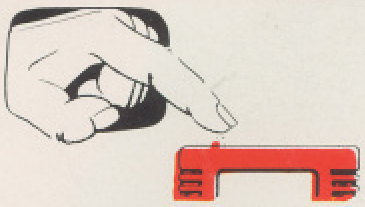
PRINTERTOOL

The POWER CARTRIDGE contains a very effective Printer-Interface, that self detects if a printer is connected to the Serial Bus or User-Port.
It will print all Commodore characters on Epson and compatible printers.
The printer-interface has a variety of set-up possibilities. It can produce HARDCOPY of screens not only on Serial printers (MPS801, 802, 803 etc) but also on Centronic printers (EPSON, STAR, CITIZEN, PANASONIC, etc).
The HARDCOPY function automatically distingishes between HIRES and LORES. Multi-colour graphics are converted into shades of grey. The PSET functions allow you to decide on Large/Small and Normal/Inverse printing.
The printer PSET functions are:

PSET 0 - *Self detection Serial/Centronics.*
PSET 1 - *EPSON mode only.*
PSET 2 - *SMITH-CORONA mode only.*
PSET 3 - *Turns the printing 90 degrees!!*
PSET 4 - *HARDCOPY setting for MPS802/1526.*

PSET B - *Bit-image mode.*
PSET C - *Setting Lower/Upper case and sending Control Codes.*
PSET T - *All characters are printed in an unmodified state.*
PSET U - *Runs a Serial printer and leaves the User-port available.*
PSET Sx - *Sets the Secondary address for HARDCOPY with Serial Bus.*
PSET L1 - *Adds a line-feed, CHR$ (10), after every line.*
PSET L0 - *Switches PSET L1 off.*

POWER RESET



On the back of the POWER CARTRIDGE there is a Reset Button. Pressing this button makes a SPECIAL MENU appear on the screen.
This function will work with any programme.

CONTINUE - *Allows you to return to your program.*
BASIC - *Return to BASIC.*
RESET - *Normal RESET.*
TOTAL BACKUP DISK - *Saves the contents of the memory onto a Disk. The program can be reloaded later with BLOAD followed by CONTINUE.*
RESET ALL - *RESET of any program.*
TOTAL BACKUP TAPE - *As BACKUP DISK but to TAPE.*
HARDCOPY - *At any moment, prints out a Hardcopy of the screen. Using CONTINUE afterwards you can return to the program.*
MONITOR - *Takes you into the Machine language Monitor.*

BDL

Bitcon Devices Ltd

88 BEWICK ROAD
GATESHEAD
TYNE AND WEAR
NE8 1RS
ENGLAND

Tel: 091 490 1975 and 490 1919 Fax 091 490 1918

To order: Access/Visa welcome — Cheques or P/O payable to BDL
Price: £14.99 incl. VAT.
UK orders add £1.20 post/pack total — £16.19 incl. VAT.
Europe orders add £2.50. Overseas add £3.50
Scandinavian Mail Order and Trade enquiries to: Bhiab Elektronik, Box 216, Norrtalje 76123, SWEDEN. Tel: + +46 176 18425 Fax: 176 18401